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Aging Saber Sharpening for War

ARNG AVIATION OF THE 80s

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page 7

page 30

page 32

2 **Preparedness,** MG Emmett H. Walker Jr.
4 **The Aging Saber Sharpening For War,** BG Herbert R. Temple Jr.
7 **Army National Guard Aviation,** John J. Stanko Jr.
10 **ARNG Aviation Operations Branch,** LTC Roger Goodrich
12 **ARNG Logistics Branch,** Al Marshall
14 **ARNG Safety Branch,** LTC Roger Perkins
16 **ARNG Multi-Media Group,** MAJ Kenneth Boley
18 **Reporting Final**
22 **An Evaluation Of Demographic Items,** CW2(P) Bernard T. Sundy; Dr. John Ruffner; Daniel Wick
26 **What Meets The The Eye . . . Real Or Illusion?**
30 **WETEYE And Army Aviation,** COL R. L. Horvath
32 **Synthetic Flight Training System Program,** LTC John J. Griffiths
35 **Threat: The Leak In The Soviet Air Defense Umbrella,** MAJ Frank E. Babiasz
38 **Aviation Personnel Notes:** MAJ Michael K. Jennings
40 **DES Report To The Field: Aeroscout Instructor Pilot Techniques**
42 **PEARL's**
44 **Cobra Versus Hind,** CPT Dale W. Moffatt
47 **Teaching Philosophy,** SP4 Rick Bretz
48 **ATC Action Line: Army Controllers To The Rescue**

Inside Back Cover: **1981 ATC Winners**

Back Cover: **Weight And Balance, CW2 Gary R. Weiland**

Cover: **The Army National Guard is rich in history and tradition. The "Aging Saber Sharpening for War" symbolizes the Army National Guard commitment to meet the Army Aviation challenges of the 1980s**

THREAT

page 35

page 44

Honorable John A. Marsh Jr.
Secretary of the Army

Richard K. Tierney
Editor

The mission of the ***U.S. Army Aviation Digest (USPS 415-350)*** is to provide information of an operational, functional nature concerning safety and aircraft accident prevention, training, maintenance, operations, research and development, aviation medicine and other related data.

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HIS ISSUE OF the ***Aviation Digest*** provides a unique opportunity for two-thirds of the Army Aviation community to become more familiar with the other third—the latter group representing the Army National Guard aviation element, a key and essential part of our total force.

Major General Emmett H. Walker Jr., director, Army National Guard, reports personally on the challenges faced by the ARNG Aviation Program and how they are being met. In "Preparedness—There Is No Second Prize for 'Runner Up,'" General Walker, a longtime friend and strong supporter of Army Aviation, stresses that ARNG aviation must use to full advantage its 39 unit training days a year to "train as it expects to fight." This is a real challenge, especially since our National Guard aviators must meet the same ATM requirements as their active force contemporaries—and you thought your ATMs were tough?

An explicit account of the Army Guard's preparation to be battle-ready is continued by Brigadier General Herbert R. Temple Jr., deputy director, ARNG, in "The Aging Saber Sharpening for War," and by Mr. John J. Stanko Jr., chief, Army Aviation Division, National Guard Bureau, in "Army National Guard Aviation." An observation aptly made by Mr. Stanko and probably not realized by some readers is that there are ARNG aviation units in all 50 states of the union as well as in Puerto Rico, the Virgin Islands and the District of Columbia.

With so many widely scattered elements, the need for effective, top-level leadership and guidance is imperative. We are given an overview of how such leadership is provided in articles dealing with ARNG aviation's operations, safety, logistics and multi-media branches by Lieutenant Colonel Roger Goodrich, Lieutenant Colonel Roger Perkins, Mr. Al Marshall and Major Ken Boley, respectively.

Within Army Aviation, outstanding performance and dedication are hallmarks of our profession and it is always a pleasure to recognize our top performers. The congratulations of the entire aviation community are due to Specialist Five Kevin R. Smith, Ft. Benning, GA, Specialist Six Joseph W. Kelly, Military District of Washington, and personnel of the Coleman Ground Controlled Approach Facility, Mannheim, Germany. SP5 Smith and SP6 Kelly were selected the Army's best air traffic controller and maintenance technician for 1981, and the Coleman GCA is the top ATC facility. More coverage on their achievement is contained herein. The contributions of our Army air traffic controllers worldwide are cause for our continuing accolades, but a special note of recognition is due to those who have responded to the national call for assistance with the FAA CONUS-wide. That too is addressed in this issue.

Highly visible in the news earlier this year was the movement of some very sensitive chemical cargo from one storage site to another. Army Aviation was very much a part of that exercise and we asked Colonel R.L. Horvath of DARCOM to describe it for us in a special article, "WETEYE and Army Aviation."

And this month we have the third in our four-part "Aviation Warrant Officer Retention" series. Its subject is "An Evaluation of Demographic Items" and offers some very interesting findings. Where do you or your unit fit into this survey? It was written by Chief Warrant Officer, CW2(P), Bernard T. Sundy, Dr. John Ruffner and Mr. Daniel Wick. One very telling point in this report is that a lack of personal counseling with regard to career intentions is most likely a contributing factor to the decision of many aviation warrant officers to leave the Army. Certainly that is something we can correct in-house! Also remember that this series was written following the in-depth study conducted at the Aviation Center by the Army Research Institute and members of the Warrant Officer Senior Course. Actions subsequent to this analysis have now seen aviation warrant officer retention pass the 60 percent mark—and rising—an excellent sign indeed.

November is always a special month with Thanksgiving time for all Americans, and we who serve our nation in Army Aviation have much to be grateful for as our contributions are being increasingly recognized on the combined arms team. Thus, as we talk and write about our role in defense should war ever come, let us be truly thankful for peace.

Major General Carl H. McNair Jr.
Commander, U.S. Army Aviation Center
Fort Rucker, AL

PREPAREDNESS

THE HEALTH OF the total Army is dependent on the Army National Guard (ARNG). The ARNG slice of the force structure consists of 33 percent of the combat divisions, 72 percent of the separate brigades, 57 percent of the Armored Cavalry regiments, 63 percent of the Infantry battalions, 43 percent of the Field Artillery battalions and 40 percent of Army Aviation.

ARNG aviation faces an enormous challenge. In 39 unit training days a year, the aviation commander must be able to field a unit that can accomplish its mission in a short-notice, global option war on a modern battlefield that is continually increasing in tempo, technology and lethality. The dynamics of modern warfare rule out prolonged postmobilization training the next time the Army and ARNG are called upon to fight.

Consider some of the training realities that face ARNG aviation. The Army organizes and reorganizes the ARNG, U.S. Army Reserve and active Army in order to meet the total Army force planning requirements. Reorganizations, as might be expected, place special demands on ARNG readiness achievement. Empathize with the ARNG aviation unit commander who has just had his unit reorganized or who has received the latest equipment. This usually causes the majority of his personnel not to be military occupational specialty (MOS) qualified. Most likely, the commander's overall yearly training requirement is too large to be immediately absorbed by the Army institutional school system nor is there sufficient time available during the normal training year to accomplish these requalifications. Additionally, very few ARNG personnel can take 10 or 11 weeks out of their civilian careers to become MOS requalified except at great personal sacrifice.

Given the training environment in the ARNG, it is critical that training designs in institutions, resident and nonresident, be attuned to the special needs and realities of this environment. The one-Army training template approach usually requires some modification for the ARNG. The training environment found in towns and cities across the United States which are the posts, camps and stations of the ARNG is quite varied. The ARNG aviation commander faces land and resource constraints that may inhibit his ability to create realistic challenging training. Even though aviation does have the mobility to move to distant major training areas, energy conservation requirements may preclude doing so. Land and training airspace once ample for training divisions is in some instances hardly adequate for battalions.

Army training has been greatly influenced in recent years by new technology. At the forefront is instructional systems development which is a behavior-oriented method of teaching or training which guides the individual, step-by-step, to complete mastery of the learning objectives. The individual may use any or a combination of innovations such as teaching machines, audio-visual devices or simulators to attain predetermined objectives. Training innovation in the simulator area has expanded at a rapid rate. However, most of these sophisticated simulators and more elaborate teaching devices are located at Army

Major General Emmett H. Walker Jr.
Director, Army National Guard

There is no second prize for "runner up"

training centers and therefore may not be readily available for most ARNG aviation units spread throughout the continental United States. We are working to make more simulators available.

Another training consideration more personnel than hardware oriented is that the average ARNG aviator is in his midthirties, wears senior wings, is a Vietnam veteran and has the same motivation for measuring up to the Army Training and Evaluation Program standards as his active duty counterpart. However, from past personal experience, he realizes that the battlefield is the ultimate and sometimes fatal measure of training readiness.

This assessment of the training realities that face the ARNG Aviation Program appears to offer insurmountable obstacles. That is not the case. The ARNG understands the reality of the training environment and accepts the challenge. To be a viable mobilization force in the 1980s, a three-part approach for the ARNG Aviation Program must be taken.

First, the ARNG Aviation Program must revitalize its ranks with young aviators. Additional quotas to the initial entry rotary wing program are being acquired to provide assistance in this area.

Second, a closer interface between the ARNG aviation training manager and his active duty counterpart must take place. The burden is on the ARNG to provide input into the training environment that explains ARNG aviation capabilities and peculiarities to the system designers. This encompasses the development of training programs and procedures to include the conduct of hands-on performance training for individuals. Examples include incorporation of the ARNG input into Department of the Army level training developments; integration of active and ARNG units into tactical threat and nuclear, biological and chemical training; and inclusion in major command post exercises and field training exercises. Additionally, training managers must assist active duty counterparts in developing and exploiting the use of exportable training packages.

The third part of the challenge is equally essential. ARNG aviation must train as it expects to fight. This includes modern, sophisticated equipment employed in meaningful training scenarios such as combined arms live fire exercises. ARNG aviation has made significant progress in obtaining modern equipment such as the AH-1S Cobra; but, this is the "tip of the iceberg" as far as total modernization requirements are concerned.

In short, we will not have the luxury of extensive postmobilization reequipping and training. The equipment and training readiness posture of the ARNG aviation on mobilization day could be what is strapped on and taken into battle several days later. ARNG aviation reorganization and equipping must parallel that of the active Army. This will require all members of the ARNG aviation community to actively pursue the maintenance of high readiness standards. Obviously, this effort will require all of us to produce training materials and opportunities that are realistic and to train to expected battlefield requirements. We can do it as a team. This combined team effort will make the transition from "come as you are" to "ready . . . now" a reality.

The Aging Saber

THE STORY STARTED long ago, but our visit into the Army National Guard (ARNG) Aviation Program will begin in the late sixties. At that time, about 1,600 aviators with varying degrees of experience from World War II and the Korean War to newly trained pilots were flying about 800 piston powered fixed and rotary wing aircraft of various levels of reliability.

The influx of Vietnam veteran aviators was just beginning and they molded nicely into the ARNG force of the late 1960s. In the early 1970s, the buildup of equipment began and aircraft now familiar to all of us began arriving in the ARNG inventory.

Through the early 1970s, the program grew, and in 1976 the ARNG reached the 2,500 aircraft and 4,500 aviator plateaus. Also during these formative years, the Guard's maintenance and facilities improved in order to meet the challenges of a greatly expanded program. New missions were met with enthusiasm and the program continued to grow in experience and ability. The new saber had been admired and polished but seldom sharpened to keep it ready for battle.

The challenges of the 1980s will be great for all in Army Aviation; but for the Army National Guard they will be even greater, for while the saber is still sharp it has aged and new honing is necessary if it is to be used effectively and efficiently. The challenges of training in attaining a younger and more modern deployable force within time constraints must be met and bested, if the ARNG Aviation Program is to remain a viable part of the total force.

We have two goals in the next few years—to reduce the average age of the aviator force, while building back to its authorized strength of 5,000. to accomplish this, increased undergraduate flight training quotas above the 90 per year we now receive is essential. The requested increase is to 205 per year, a number we feel comfortable with when dealing with 53 inputting entities. The ability of each state to recruit for quality prospects each year should enhance not only our output from flight school but the overall quality as well.

Additionally, the influx of this new blood, these new aggressive young leaders merged with our already experienced, established force can only serve to spur both groups on to bigger and better achievements. This will result in the new learning from the old and the old retaining the competitive spirit that exists among all aviators.

We continue to train to fight. Among the current ARNG aviator force, more than:

- 4,300 are instrument rated
- 3,400 are nap-of-the-earth qualified
- 500 are weapons qualified in the equipment on hand.

All these programs are ongoing and continuous and all our aviators are using the aircrew training manuals with their task oriented training as the basis for their training programs. We are dedicated to sharpening the force new and old for war.

The Guard aviation fleet has come a long way in the past 10 years and while the majority of the 2,530 aircraft assigned are the authorized types, we still have some problem areas. The biggest area of concern is in attack aircraft where the majority of the fleet is still UH-1B, C and M Hueys. Yes, Cobras, even S-models, are now being received by the ARNG, but the problem will exist for some time to come. Other examples of fleet differences are OH-6 Cayuses and OH-58A Kiowas in lieu of OH-58Cs and CH-47A Chinooks in lieu of CH-47Cs. The ARNG now possesses all the CH-54 Tarhes in the Department of Defense inventory and the UH-1 fleet is aging with no relief in sight.

The fixed wing fleet is a mixed bag of U-3 (Cessna 310), T-42 Cochise, U-8F Seminole and a few U-21A Ute aircraft.

There are a few bright spots on the horizon. More AH-1S

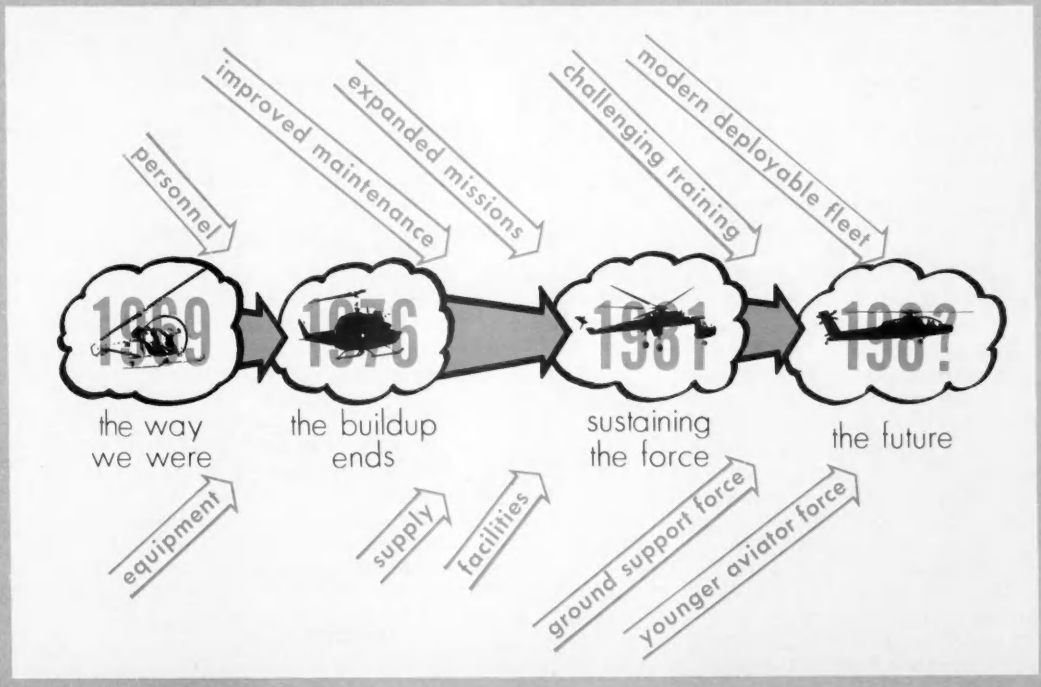
Brigadier General Herbert R. Temple Jr.
Deputy Director
Army National Guard

Sharpening For War

Cobras have been identified for the Guard and more U-21s are also due to filter down in the next few years. The fleet is still sharp, but constant effort must be made to keep it that way. That effort must come from all involved in the aviation program, not from the Guard alone.

We have looked at some history, the force and the fleet, now let's look to the future and what's needed to really sharpen the saber for war.

Basically, what the ARNG asks is for the aircraft to meet our wartime missions. We must be trained on the aircraft presently deployed and planned for deployment, not just our aviators, but our maintenance and ground support personnel as well. We need Cobras and UH-60 Black Hawks at least in sufficient numbers to be able to train our cadres and trainers. We need scouts compatible with the active Army's, CH-47Cs and Ds to replace our overextended CH-47As and we need mission support aircraft



which will carry more than two passengers to permit our aviation program to assist our senior commanders in accomplishing their training programs. Without the proper equipment, the saber will become dulled no matter how we try to sharpen it.

With the proper equipment, we will be able to train for our wartime requirements. To properly train, we must have tactical air traffic control equipment and night vision goggle training equipment to permit our aviation force to train at the same time and in the same methods as their active force counterparts.

This training goes far beyond the aviator force. The ARNG Aviation Maintenance Program is recognized as one of the finest; but to keep it so, our maintenance and ground support personnel must know how to maintain and fix any aircraft they are likely to see. This is especially true of our aviation depot roundout and aviation intermediate maintenance (AVIM) units.

As we receive new aircraft, we must ensure the logistical packages are available to support and accompany them. We in the Guard can no longer be expected to test and fix everything on the flightline with solely a mechanic's toolbox. The test equipment and special tools needed to maintain sophisticated equipment must accompany the equipment or we must be prepared to see it sit in a nonoperational condition.

Our units need to be trained in the geographical areas and alongside the units they can be expected to fight with. Training in Europe is ongoing on a limited scale for our aviation units, but how about the other areas of the world. Not only in other locations but in other environments as well. In the deserts and mountains, in the heat of Arizona and the Caribbean and in the cold of Alaska. We have units which train in these locations regularly because they are based there, but we must cross-train our other aviation units in these unusual environments. Only with realistic training and modern equipment will we be able to entice the number and caliber of young personnel needed to fill our aging ranks. The aviation leaders of tomorrow want to use the latest equipment and will accept the challenging training requirements of the modern battlefield, but we must have something to offer. If we are to get the finest of the crop from our officer candidate schools and enlisted ranks, we must promise them more and deliver more than just a set of wings to wear. We must provide them the capability to fight and survive on the modern battlefield.

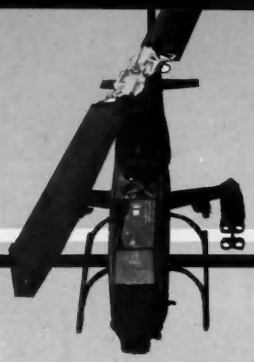
To really sharpen the sword, the ARNG must be invited to participate in more joint exercises. We cannot train in a vacuum. We must interface with other aviation elements, other members of the combined arms team and the other services. Our attack companies must work with the Air Force's A-10s, our lift units with infantry and mechanized infantry. We must train as a team if we are to fight as a team.

If given the equipment, the Guard will man and maintain it. If given the time and the means, it will train effectively and the saber will be sharpened for battle no matter what the mission.

ARMY GUARD AVIATION OF THE FUTURE . . .
AIRCRAFT TO MEET WARTIME MISSIONS
AVIATORS TRAINED TO WARTIME REQUIREMENTS
RELIABLE GROUND SUPPORT PERFORMANCE
TRAINING IN REALISTIC ENVIRONMENTS
ENHANCED GROUND SUPPORT EQUIPMENT
QUALITY AND QUANTITY PILOT CANDIDATES TO MEET DEMAND
EUROPE-PACIFIC CARIBBEAN-ALASKA
ASSUME NEW MISSIONS
UNISERVICE, COMBINED AND JOINT EXERCISES
FLEXIBILITY IN TRAINING TIMES
AF—ARMY—NAVY—STATE
. . . READY FOR WAR

MONTHLY WRITING AWARD

Mr. John J. Stanko Jr.



Army National Guard Aviation

ON 7 OCTOBER 1981, the Army National Guard (ARNG) celebrated its 345th birthday.* Through successive reorganizations many units perpetuate the honors and traditions of historical units. While only a very few of the ARNG aviation units are carrying on famous numbers, all are inbred with that sense of tradition of the regiments, brigades or divisions in which they serve. However, ARNG aviation is earning its wings every day in an area as valuable as traditions to our country. It's called "readiness."

Whenever one begins to discuss the Army Aviation Program in the National Guard it is necessary to touch lightly on background. Army Aviation has been part of the ARNG ever since the Guard's reorganization after World War II. The aircraft inventory in the ARNG (see figure 1) is a story in itself and is best told at another time over a bottle of wine. It includes almost every aircraft that has ever been in the active inventory and a few that weren't. It includes aircraft categorized as contingency and training (C&T), a term most active Army personnel never need to deal with. What the term connotes is a weapon system for which the Army is no longer in a position to sustain logistical support. The outstanding aviation logistic support program throughout the ARNG had as its foundation the challenging task of maintaining C&T aircraft.

The transformation of ARNG aviation from 1970 through 1981 is an amazing accomplishment. During the dark days of the Tet Offensive, plans reverberated around the Pentagon for mobilization of a tailored force to reinforce the American forces in Vietnam. Within the ARNG only two aviation companies were available for immediate deployment. They were the medium helicopter companies; the 1105th in Iowa and the 48th in California. These were the only two companies that had TOE (table of organization and equipment) authorized aircraft (CH-37 Mojave) of the same type series and model as the active Army deployed units. (Temporary aviation units in Vietnam were equipped with the new CH-47 Chinook aircraft.) The Guard companies were 100 percent strength, more than 90 percent MOS (military occupational specialty) qualified, but had issued to them only 8 aircraft instead of the authorized 18. In each company, the eight aircraft were flyable and deployable. They were not mobilized. Two ARNG aviation units were eventually called to active duty but did not see combat as units. When you have been training with, and maintaining OH-23B Raven and L-19 Bird Dog aircraft as substitute systems for UH-1 Hueys, accomplishing the unit's tactical mission will require an appreciable amount of time beginning with receipt of the TOE aircraft. Although ARNG aviation units were not called to active service, almost 300 ARNG aviators volunteered for service in Vietnam. Their contributions and performances were sterling and even though they lost their identity as Guardsmen, we in the ARNG program followed their accomplishments with pride. There were many exceptional individuals, but one stands out.

In late 1964, Captain Jerome E. Daly was a member of the 28th Aviation Battalion, Penn-

*The National Guard traces its lineage to the old North and East units of the Regiments of Massachusetts, which were formed in 1636.

Figure 1

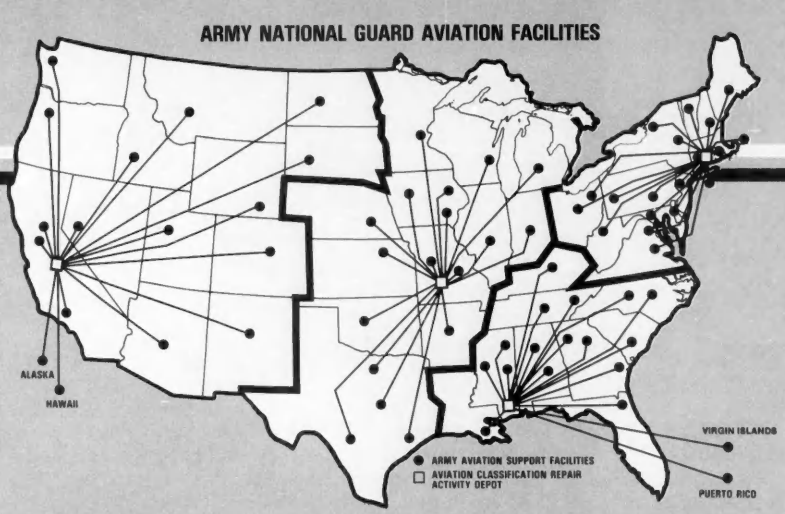
FIXED WING	
L-4	U-9
L-5	U-10
L-17	U-21
O-1	T-42
U-1	OV-1
U-3	C-7
U-6	C-45
U-8	UV-18

UTILITY ROTARY WING	
UH-1	UH-19

CARGO ROTARY WING	
CH-34	CH-47
CH-37	CH-54

OBSERVATION ROTARY WING	
OH-6	OH-23
OH-13	OH-58

ATTACK ROTARY WING	
AH-1	UH-1M
TH-1	



sylvania Army National Guard, with a desire to serve in Vietnam. Negotiations with the Infantry Branch at the old Tempo A buildings indicated that active duty as a captain was not available but the Warrant Officer Branch would offer a WO1. Laying aside his federally recognized commission as an ARNG captain, WO Daly went to war. By cessation of hostilities he had flown more than 2,500 combat hours on three and a half tours, been selected as the Army Aviator of the Year in 1967, received every combat decoration for bravery except the Congressional Medal of Honor, was decorated in the field personally by the Army Chief of Staff, General Harold K. Johnson, and subsequently received a direct commission to captain. LTC Daly remained on active duty and is now assigned to the U.S. Army Materiel Development and Readiness Command (DARCOM).

Army Aviation in the ARNG in 1981 is dramatically different than it was during the period of the Tet Offensive. We are no longer a people pool. The 157 aviation units have an average strength of 95 percent, use the Aircrew Training Manual as their prescribed flying hour programs, respond immediately to various state disasters or emergencies, are mobilizable, deployable and capable of mission accomplishment.

The ARNG was the first major command to be completely reorganized under Aviation Requirements for the Combat Structure of the Army (ARCSA) III. The seven ARNG aviation intermediate maintenance (AVIM) companies, upon mobilization, will be the equal of any in the Army. The four aviation classification repair activities (depots), which augment Corpus Christi if mobilized, are the only units of their kind in the Army. These units, planned for early deployment, are already at 104.7 percent strength and closing on combat ready no deficiency ratings.

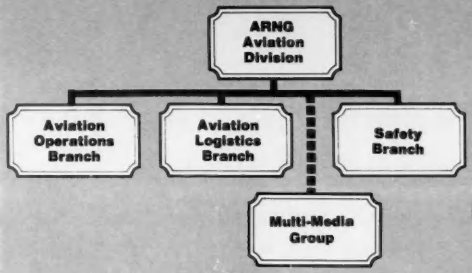
In Alaska, the 207th Arctic Reconnaissance Group comprised of Eskimo teams is supported by ARNG aviation. The Alaska ARNG uses UV-18s, the only Twin Otters in the Army inventory, to accomplish their mission. Another de Havilland product, the Caribou CV-2, in hiatus for 10 years with the Air Force, is being put back into Army service by the ARNG as this article goes to press.

Every one of the 50 states, Puerto Rico, the Virgin Islands and the District of Columbia has an ARNG Aviation Program. Beginning with the transfer of five UH-1Hs to the Texas ARNG in 1971, the National Guard Bureau (NGB) has invested heavily in support of its ARNG Aviation Program. Construction, schooling, training dollars, authorized stockage list funding, depot funds and manning have all received enthusiastic support from the National Guard Bureau chiefs, Army directors and their staffs. The ARNG aviation community has responded to that support with achievement, professionalism and an enhanced readiness far beyond what used to be considered unattainable for Reserve forces.

Management and staff supervision of the ARNG Aviation Program have been assigned to the Aviation Division, Army Directorate of the National Guard Bureau. In the 1976 to 1977 timeframe, NGB assigned the responsibility for management and staff supervision of the complete ARNG safety program to the Aviation Division to include occupational safety and health, industrial hygiene

Mr. John J. Stanko Jr.
Chief, Army Aviation Division
National Guard Bureau

Miss Debbie Horne
Secretary



and all aspects of the multifaceted safety effort. This was a harbinger of things to come because in December 1978, the Army reorganized the United States Army Agency for Aviation Safety (USAAAVS) into the U.S. Army Safety Center, chartered to provide support to the entire Army safety effort, not just aviation.

To manage these two dynamic programs, the Army Aviation Division, NGB, is organized into three branches and also has operational control of a multimedia team at Ft. Rucker, AL (see figure 2). In other articles in this issue, their roles in the management effort are described. The style of management that we use is repeated from branch to branch, program to program. Each branch is assigned its mission which in broad terms points the way. Simultaneously they are provided an interface chart which actually assigns their parameters. Then they must provide report cards in a regular sequence which annotate the progress toward established standards, which in all cases are the same as those prescribed for active Army aviation units and aviation personnel.

The potential for significant contributions to the Army's combat readiness by ARNG aviation has rarely been explored in depth. To list just a few, consider that:

- ARNG aviation has a seasoned cadre of trainers and maintainers who operate in the diverse geography and meteorology of the 50 states and territories year round: from the hot deserts of southern Arizona to the Arctic Circle in Alaska, from the sea level Jersey and Florida coasts to the 7,200-foot field elevation at Santa Fe, from the overwater operations in the Hawaiian Islands to the 11,000-foot operations in the Rocky Mountains and winter operations along the Canadian border from Montana to Maine.
- The retention rate of ARNG Guardsmen who attend initial entry flight training is at 87 percent after 10 years, a remarkable percentage which amortizes the high cost of producing an aviator.
- The location of ARNG aviation in the population centers of each state provides for a recruiting base that takes advantage of every corner of our country.
- The finest Army Aviation facilities in the world are now in the ARNG.
- The expertise in aviation maintenance is a mean composite displayed in achievement of operational readiness of the ARNG aircraft inventory at or above the established standard objective (70 percent) year after year, recognizing that this includes a complete mix of 2,500 Army aircraft.
- The ARNG continues to explore new and better ways to be of service, i.e., depot roundout program to help DARCOM meet the surge of mobilization requirements in continental United States (CONUS) and outside CONUS; Army Aviation training centers to help U.S. Army Training and Doctrine Command meet mobilization surge requirements for aviation graduate training and aviation refresher training; an aviation maintenance man-hour accounting program to develop a meaningful ratio of maintenance man-hour to flying hour for peacetime flight operations.
- The Attack Helicopter Company, 163d ACR, Utah ARNG, in 1 year with just 7 AH-1 Modified Cobras has trained the entire company and 14 crews, and is now in the process of exchanging the Modified for Fully Modernized Cobras. This has profound importance as the Army considers POMCUS (prepositioning of materiel configured to unit sets) of aircraft.
- Finally, cost effectiveness. If an aviation unit can be maintained in the ARNG at a respectable readiness posture for about one-third the cost of maintaining that unit in the active Army, then there will be available to the Army two-thirds of the cost to invest in other critical areas, or provide a cost avoidance to the United States at a time when we desperately need cost reduction, or provide the most economic means of expanding Army Aviation to support additional divisions or the reorganization to "Division 86."

ARNG aviation is living the Total Army Program, demonstrating that citizen Soldiers are capable of achieving, maintaining and sustaining a combat ready level of proficiency in the most sophisticated equipment that is provided their units and that units can achieve an operational readiness restricted only by the imagination of their leaders.

ARNG Aviation Operations Branch

LTC Roger Goodrich

DURING THE PAST 12 months, the Army National Guard (ARNG) has made significant strides in aviation training. Issues unique to an ARNG training environment were recognized through the Army standardization channels, resolved and in some cases adopted for use Armywide. Close coordination with the U.S. Army Aviation Center (USAAVNC), Ft. Rucker, AL, resulted in ARNG implementation of an aircrew training manual (ATM) which provides a logical progression of ARNG aviator training based on realistic time progressions and task proficiency. For the sixth year, the standardization instructor pilot/instructor pilot refresher training program was conducted in conjunction with USAAVNC, Forces Command (FORSCOM) and the U.S. Army Safety Center. This provided ARNG instructor pilots an essential update through academic and refresher flight training. Centralized management between FORSCOM, USAAVNC and National Guard Bureau (NGB), with decentralized accomplishment at unit/facility level, has resulted in the annual program being tailored to the needs of the field, particularly in the low density aircraft.

To maintain its force of 5,000 aviators, the NGB was authorized an increase in the initial entry rotary wing (IERW) quota. There will be a ramp up starting in fiscal year (FY) 1982 of a 140-IERW quota for the ARNG increasing to 205 in FY 1985 and beyond.

Ongoing force modernization will ensure ARNG aviation units are capable of meeting mobilization readiness requirements. An ARNG antiarmor capability will become a reality with continued distribution of AH-1S modified and modernized Cobras. Premobilization training in nondeployable aircraft will be significantly reduced or eliminated during the 1980s. As a result, ARNG aviation units will become increasingly compatible with their active Army counterparts in readiness for mobilization missions.

Flight simulation in the ARNG has expanded beyond requirements. Texas ARNG has been using the CH-47FS at Ft. Rucker and an innovative 6-hour emergency condition recognition training program has been developed for UH-1 Huey aviators.

The ARNG aviation training sites' (AATS) development is on schedule. As they come on line in the FY 1982 to 1985 timeframe, the AATSs, in coordination with USAAVNC, will provide standardized individual training in low density and ARNG unique aircraft. The Eastern AATS was activated 1 August and the Western is slated for FY 1985.

The ARNG has worked with FORSCOM to reorient CONUSA (the numbered armies in the continental United States) evaluations from ARNG aviation support facilities to ARNG aviation units. Concentrating on the unit will have a positive effect on ARNG aviation unit training and mobilization readiness.

The Guard emphasizes training to ATM standards for night (N) skills. Several units are actively training in Night Hawk (NH) skills, one of which will progress into night vision goggles (NVG) in FY 1982. The NH and NVG program will be expanded in FY 1982 through an NH/NVG military occupational information course at Ft. Rucker. An ARNG IP on tour at the USAAVNC will qualify an initial cadre of 25 ARNG IPs. ARNG IPs will then return to their states and initiate an aggressive NH/NVG qualification program. Training will be conducted in accordance with FORSCOM priorities. Also, unit level distribution of variable density day light filters was completed in September 1981, further enhancing our ability to conduct NVG training.

Low level tactical instrument training is conducted during visual meteorological conditions at military reservations or geographical areas with nondirectional beacons and low population densities. But, concern continues to surface about the feasibility of training light observation helicopter and attack helicopter pilots in tactical instruments when these aircraft remain uncertified for instrument flight rules flight. In areas where tactical beacons are not available, the ARNG will continue to emphasize tactical instrument training at altitude with civilian instrument navigational aids or commercial radio stations. Where ARNG units have access to synthetic flight training system facilities, the SFTS provides the primary tactical instrument training program.

Integration of the ATM with unit ARTEPs (Army Training and Evaluation Programs) is increasing ARNG involvement in combined arms operations. Significant progress has been made

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Mrs. Sharon Schmitt
Secretary

Mr. Joseph Ebaugh*
Avn Personnel Mgt Team Leader

Mr. Walter Mueller*
Operations Team Leader

Mr. Arthur Ries*
Training & Stndz Team Leader

Mrs. Marilyn Ciufo
Mil Personnel Technician

LTC Gary Adams**
Operations Staff Officer

Mr. Ronald Eaton*
Training & Stndz Specialist

*Member Maryland ARNG
**LTC Goodrich—California Guardsman on Tour
**LTC Adams—Utah Guardsman on Tour

Miss Mary Jo Smith
Mil Personnel Technician

Miss Debbie Harward
Clerk Typist

Air Guard, Army Guard and active Army air traffic control (ATC) participation. As an example, Sentry Castle is a New York ARNG joint training exercise (JTX) for the 42d Infantry Division which integrates OV-1 Mohawks from the Georgia ARNG, CH-47 Chinooks from Pennsylvania ARNG, UH-1 and OH-6A Cayuse helicopters from New York ARNG, Air National Guard A-10 close air support aircraft and active Army ATC units.

Limited progress continues in airspace management due to shortage of equipment and lack of repair parts. But, progress is being made with JTXs as exampled by the 58th ATC Battalion, Ft. Bragg, NC; Co C, 28th Aviation Battalion, Virginia ARNG; and the 149th Aviation Battalion and 57th ATC Battalion at Ft. Ord, CA.

Guard aviation constitutes about one-third of the total Army Aviation Program and incures only 12.3 percent of the total DA flying hour program. ARNG aviators logged more than 28,000 ATM creditable hours in flight simulators in each of the last 2 years. The ARNG is exploring increased use of simulation as a viable alternative to offset petroleum, oils and lubricants funding constraints. Ninety-one percent of the 293,375-hour FY 1981 program will be applied toward ATM requirements in conjunction with mission support. This is in support of the Guard's 5,000 aviators, 156 MTOE (Modification Table of Organization and Equipment) and 61 TDA (tables of distribution and allowances) units. Briefly stated, ARNG aviation is cost effective in providing combat ready aviation support to the total force.

ARNG Logistics Branch

Mr. Al Marshall

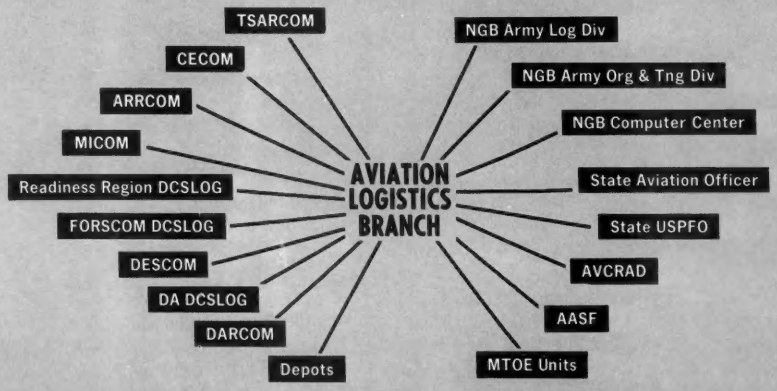
EXPANSION OF Army National Guard (ARNG) aviation programs has elevated the status of its aviation units from their former "poor country cousin" role to a force of well-trained professionals with modern facilities, aircraft and equipment. The ARNG has an objective composite operational readiness (OR) rate of 70 percent for its 2,500 to 2,600 aircraft. The mean OR rate is consistently above that objective. Managing a program of this magnitude requires constant attention to innumerable details, but the ultimate key to success lies with the people who comprise the ARNG Aviation Program.

ARNG aviation units have the objectives to train their personnel to assure high levels of proficiency and to maintain a combat ready fleet of aircraft that can readily be deployed. To provide the necessary backup maintenance support for the aviation units to attain and maintain these objectives, each state is organized with one or more Army Aviation Support Facilities (AASF), each with aviation unit maintenance (AVUM) and limited aviation intermediate maintenance (AVIM) capability. In addition, there are four Aviation Classification Repair Activity Depots (AVCRAD) which provide the ARNG with nondivisional AVIM and approved depot level repair capability. These four AVCRADs located at Fresno, CA; Gulfport, MS; Springfield, MO; and Groton, CN, provide aircraft logistical services within their geographically designated support areas.

The AVCRAD's premobilization mission is to provide day-to-day AVIM and approved depot level maintenance support requirements for the 2,500 to 2,600 aircraft assigned to the ARNG. The AVIM maintenance authorization is prescribed by Army regulation and Army technical manuals. Depot level maintenance repairs and services are authorized by Department of Army (DALO-AV) on a case-by-case basis, and accomplished in accordance with U.S. Army Materiel Development and Readiness Command depot maintenance work requirements. The mobilization mission of the ARNG AVCRADs is unique. Upon mobilization they will augment the existing U.S. Army aircraft depot maintenance system with subsequent deployment to meet existing contingencies. The difference in the basic organization of the premobilization maintenance mission of these units and facilities, as compared with active Army units, necessitates a different method for managing this maintenance program.

National level management and guidance for this dynamic aviation logistical program is provided by the Aviation Logistics Branch of the ARNG Aviation Division located at Aberdeen Proving Ground (Edgewood Area), MD. The mission of the Logistics Branch is to:

- Perform logistics management functions of aviation assets within the Army National Guard.
- Provide liaison with all materiel readiness commands.
- Supervise the AVIM program in the Army National Guard.
- Maintain operational control of the four AVCRADs.



The branch is structured to accommodate maintenance, supply, quality, force structure, logistics readiness and fiscal management in support of the ARNG Aviation Program. The Aviation Logistics Branch is the ARNG interface between the U.S. Army agencies and the ARNG units and state agencies for aviation logistical matters (figure 1). These interfaces, in conjunction with national level planning, AVCRAD geographical area management and state operation have had a significant positive impact on the logistical support of the aviation program.

The report card for the logistics program has been exceptional. It has provided support to the ARNG aviation fleet at or above the Department of Army standards for the past 6 years while supporting the flying hour program at minimum cost to the ARNG and the Army. At the same time, a successful effort to increase equipment reliability, decrease the maintenance backlog, operate a successful cost effectiveness program and to authorize equipment to provide proper maintenance and operational support has exceeded expectations.

The success of the individual ARNG aviation units, the state AASFs, the AVCRADs and the ARNG Aviation Logistics Branch has provided a logistical support program which has contributed to the success of the entire Army Aviation Program. These and future endeavors will ensure a force capable of providing ready units for Army contingencies throughout the world.

MAJ (P) Carl Hill
Aviation Readiness Officer

Mr. Alvin Marshall**
Chief, Aviation Logistics Office

Mrs. Jeanne Ulrich
Secretary

Mr. John Johnson*
Materiel Team Leader

Miss Mary Walker
Clerk Typist

Mr. Rodney Lindsay*
Maint Team Leader

LTC Lionel Jackson**
Readiness Project Officer

Mr. Jerry Nowicki*
Supply Mgt Spec

Mr. Donald Bowes*
Quality Assurance Spec

Mr. Roy Harper*
Librarian

Mr. Robert Recker*
Supply Mgt Rep

Mr. Richard Taylor*
Supply Mgt Rep

Mr. Jack Sink*
Equip Spec (Acft)

Mr. Alberto Jimenez*
Equip Spec (Acft)

Mr. Franklin Thompson*
Supply Mgt Rep

Mr. Bob Dickens*
Equip Spec (Acft)

*Member Maryland ARNG
**Mr. Marshall (06)—Maryland ARNG Mobilization Aircraft Control Element (MACE) Commander
**LTC Jackson—Virgin Islands Guardsman on Tour

ARNG Safety Branch

Lieutenant Colonel Roger Perkins

PRIOR TO THE current organization of the Army National Guard (ARNG) Safety Branch, Major General Francis Greenlief, former chief, NGB, recognized the necessity for creating an ARNG Aviation Safety Office. Major Charles R. Strickland organized such an office in 1972 with a skeletal staff composed of short-tour personnel. Late in 1973, the first full-time technicians were hired to assist in the development of the rapidly expanding ARNG Aviation Safety Program.

Noting the ever-increasing personnel and equipment losses in ARNG general safety areas, it was decided in 1975 to establish the ARNG Safety Branch within the ARNG Aviation Division. As a result of these added responsibilities, the mission was realigned to encompass the development and direction of safety management for all ground and aviation elements of the ARNG. This program presently includes safety policy development, program control and guidance and program evaluation at all levels. Additionally, its purpose is to reduce manpower, equipment and monetary losses through mishap prevention with the ultimate objective being a "zero" accident rate. This, in turn, enhances the Army National Guard's combat readiness through resource conservation.

The primary goals of the ARNG Safety Branch are to:

- Ensure that written regulations and directives for safety are both current and germane to the ARNG program.
- Establish well-trained safety personnel in all states and territories.
- Assist the several states in securing adequate equipment and facilities required for safe operations.
- Improve safety through special emphasis prevention programs based on a review of accident reports, suggestions and safety studies to aid the several states in their accident prevention efforts.
- Recognize deserving states, units and individuals with appropriate safety awards and assist in the establishment of safety award programs in the several states.
- Supplement the ARNG training and standardization programs with appropriate safety training programs.
- Monitor compliance by the several states of Public Law 91-596, Occupational Safety and Health Act, for federal employees.

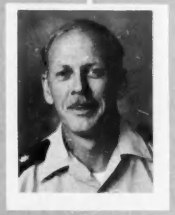
These functions can only be accomplished through constant coordination with the many agencies and the several states involved. The ARNG Safety Branch works closely with the U.S. Army Safety Center and Department of Defense and Department of the Army safety offices to enhance all accident prevention efforts. Only by working together can we hope to achieve the maximized effort necessary to reduce our losses and enhance our readiness.

LTC Roger Perkins**
Chief, Safety Branch

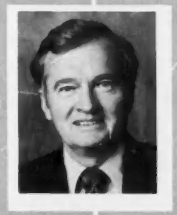
Mrs. Agnes Eisenhart
Secretary

Mr. Timothy Flynn*
Aviation Safety Team Leader

Mr. Garland Hughes
General Safety Team Leader



LTC Clarence Suggs III**
Aviation Safety Specialist



Mr. David McCormack
General Safety Specialist

Mr. Christopher Staley
General Safety Specialist

Ms. Vivian Deal
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**LTC Perkins—Idaho Guardsman on Tour
**LTC Suggs—Delaware Guardsman on Tour

ARNG Multi-Media Group

Major Kenneth Boley

THE ARMY National Guard (ARNG) Multi-Media Group (MMG) located at Ft. Rucker, AL, manages, develops, coordinates and monitors the planning and administration of all multimedia instructional programs for ARNG aviation. The MMG influences the training of about 5,000 ARNG aviators and crewmembers via a learning center network at the 90 aviation facilities throughout the 50 states, the District of Columbia, Puerto Rico and the Virgin Islands. The Multi-Media Group also manages the safety education program for the ARNG. The program influences more than 340,000 Guardsmen and covers all aspects of safety to include aviation and general safety and the Occupational Safety and Health Act (OSHA) of 1970.

The MMG is under the operational control of the Chief, Army Aviation Division, National Guard Bureau, and the military control of Headquarters, Alabama National Guard. Logistical and administrative support is provided by the U.S. Property and Fiscal Officer (USPFO) for Alabama.

Versatility is the key. WO1 Swihart, the Media Group illustrator, must apply his talents to a variety of projects ranging from posters to 35 mm slides

The Group was originally organized to support the individual aviator proficiency training program throughout the Army National Guard by developing audiovisual packages composed of all available multimedia material in the Department of Defense structure. Currently, the Group supplements the program by developing and producing audiovisual material for ARNG peculiar requirements which cannot be satisfied by other sources. This mission is possible due to the media-oriented staff and in-house television, slide and audio recording production capability. The acquired or developed material is then distributed to the ARNG learning centers established at each aviation support facility. During fiscal year (FY) 1981 in excess of 1,800 individual lessons were furnished to those training centers.

The MMG had recognized a need for aviation life support equipment (ALSE) training in the ARNG in 1979 but found an absence of appropriate training materials in the Army structure. Thus plans were begun to design an exportable program with which to train ARNG ALSE technicians, aviators and crewmembers. The first aspect of the program involved the design and production of ALSE posters, and once they began being fielded DARCOM headquarters adopted them for use in the active Army. During FY 1981 more than 5,000 individual posters were distributed to the ARNG and to Army units worldwide. The next phase of the ALSE program involved coordination with the other services for existing materials and the in-house design and production of programs to satisfy Guard-peculiar requirements. By the end of FY 1981, the Group's library supporting the field contained nearly 20 separate lessons on various aspects of life support with many additional programs scheduled for production.

The MMG's general safety mission, first assumed in 1977 and actively pursued the following year with the addition of a training specialist (safety), made tremendous strides in FY 1981. A

MAJ Kenneth Boley
Manager

Mrs. Shirley Hughes
Administrative Specialist

CPT Gary DeKay
Safety Tng Specialist

CW3 William Shawn
Avn Tng Specialist

WO1 Ronald Swihart
Illustrator

SSG Jules Hobbie
Media Specialist

Guardwide completely exportable *Unit Safety Officer/NCO Training Course* was implemented via in-house productions and civilian contract productions through the training extension course (TEC) systems in the Beseler Cue See format. Additional lessons are scheduled for distribution each month until all 2,900 Guard armories and associated facilities have the complete course. During the year a second course on *Range Safety* was designed for development by the TEC system and 10 lessons were in various stages of design or production by the end of FY 1981.

State-of-the-art audiovisual equipment is one aspect of the multimedia effort. SSG Hobbie is shown editing an in-house television production

In a totally different area, the Group expanded upon experience gained the previous year with Special Emphasis Safety Programs and designed a national campaign to reduce injury and property damage accidents in Army motor vehicles (AMVs). The rewarding success of the 1979 program, which received U.S. Army Chief of Staff support, served as a springboard for the second program entitled, "Operation Safe Guard 1—Arrive Alive." Emphasizing special safety problems associated with selected vehicle operations, the program incorporated a 16 millimeter (mm) film, recall decals, posters and driver aids to emphasize correct driver operations. The program is expected to achieve significant reductions in injury, fatality and property damage loss involving AMV operations.

Another major program during FY 1981 involved the design and distribution of posters addressing all aspects of safety. Throughout the year more than 60,000 posters were mailed to facilities Guardwide.

The year proved to be an exciting one for the Multi-Media Group, with advancements made in many areas. A totally new state-of-the-art video production system was acquired which tremendously expanded in-house capabilities. Two 16 mm films were designed for the Guard and completed by the Army photographic facilities at Redstone Arsenal, AL.

With the ARNG becoming more and more a vital portion of the total force concept, Multi-Media is keeping pace by fulfilling its role in the overall National Guard Bureau program.

REPORTING FINAL

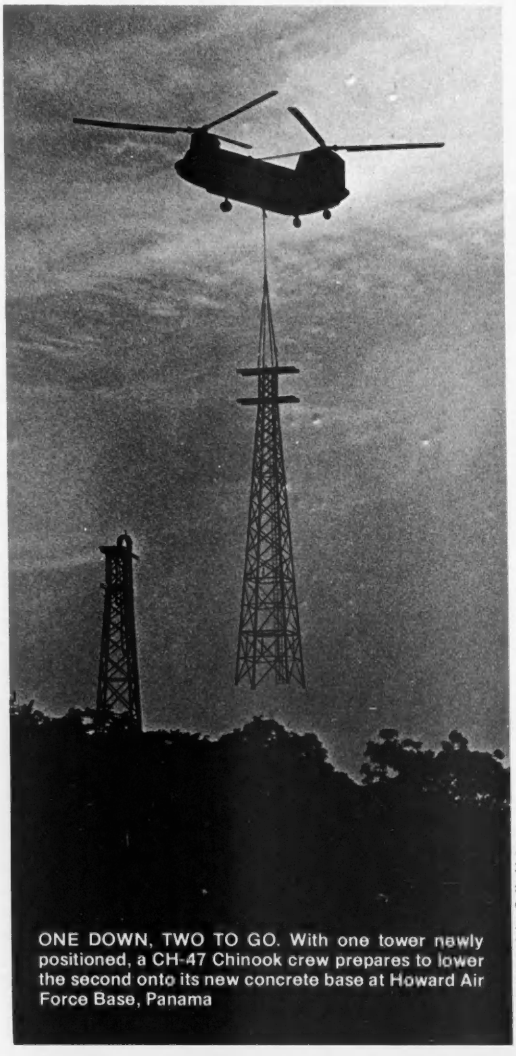
Late News From Army Aviation Activities

FROM PANAMA

A Moving Experience. A recent triservice project starred CH-47 Chinook helicopters from the 242d Aviation Company, 219th Combat Aviation Battalion, 193d Infantry Brigade (Panama). The Army helicopters lifted three 77-foot high antenna towers from a Navy communications facility and moved them about 2 air miles to an Air Force base.

Each of the 6,300-pound towers had to be hooked to the Chinook by the use of a "shepherd's crook." That called for maneuvering the helicopter within feet of the tower's tip and required close coordination between the crewchief and the pilot.

It is estimated the project would have taken a month to accomplish if the towers had had to be disassembled, moved by road and then reassembled. The Chinook crews finished the work in an hour! **(Colin Hale, 193d PAO)**



ONE DOWN, TWO TO GO. With one tower newly positioned, a CH-47 Chinook crew prepares to lower the second onto its new concrete base at Howard Air Force Base, Panama

photograph by Colin Hale

FROM FORT RUCKER

Improved Cobra Training. The first class of the new AH-1S (Fully Modernized) Cobra Qualification Course at the Army Aviation Center ended 6 October. The 6-week program combines instruction which was previously given in the qualification course and the TOW missile course. It is conducted solely in the AH-1S (FM) helicopter rather than the variety of Cobra models which were used before. Class graduates were:

MAJ Fred L. Close Jr.	CW2 Stanley S. McGowen
MAJ David D. Smith	CW2 David C. Vessey
CPT Robert C. Blix	WO1 William S. Apke
CPT Halstead N. Green	WO1 Douglas G. Bovard
CPT Thomas B. Peterman	WO1 James T. Heater
1LT Richard R. Jones	WO1 Richard A. Hines
2LT Reginald R. Gillis	WO1 Jeffrey J. Johnson
2LT David W. Marck	WO1 Howard R. Peacock
2LT Steven S. Moore	WO1 Gregory T. Schullo

Trailblazer. Second Lieutenant Danna Maller, a member of the history-making West Point Class of 1980, became the first female graduate of the

EVERYTHING'S STEADY. Second Lieutenant Danna Maller and instructor pilot Chief Warrant Officer, CW3, Donnie R. Willis go over the rotor connections of a UH-1 Huey helicopter before taking off on a routine training mission at Ft. Rucker, AL. She is the first female graduate of West Point to earn her Army Aviator wings.

U.S. Military Academy to earn her Army Aviator wings when she completed rotary wing flight training in September.

In her senior year at the academy, she selected aviation as her career field, along with two other women of the 62 who were the first to receive their commissions from that previously all-male institution.

LT Maller said she is considering making a career of the Army and that being in aviation will have a positive influence on that decision. "I like flying," she said.

Museum Getting Closer. The recent Army Aviation Center Museum Foundation fund drive for post personnel collected $80,250—far surpassing its goal of $25,000.

Employees of Northrop Worldwide Aircraft Service, Inc., donated $52,407 in cash and payroll deduction pledges. An additional $3,000 was contributed by unions Northrop personnel belong to and by Northrop's Management Club. The average Northrop contribution was $54.38 per person.

Mr. Ed Brown, director of development for the foundation, said that the total amount included in the worldwide drive to raise $2 million for a new museum building now totals $490,000, including pledges for the next 3 years.

An exciting development, he noted, is that the Governor of Alabama has promised his support in obtaining $1 million from the state. Governor Fob James was visited 6 October by a 26-member delegation from Ft. Rucker and the surrounding cities. The governor was advised that the money should be thought of as a wise investment rather than as a gift, based on the fact that the Army Aviation Museum is the seventh largest tourist attraction in Alabama. With the advantages the proposed building will offer, it is anticipated that it would be ranked even higher.

While such an amount from the State of Alabama would speed the drive along, Mr. Brown stressed that foundation officials realize the museum will only be built as quickly as Army Aviation people decide they want it built. Each person, either individually or as part of a unit, organization, etc., can have a part by making a tax-deductible contribution to the Army Aviation Museum Foundation, Inc., P.O. Box H, Ft. Rucker, AL 36362.

REPORTING FINAL

Late News From Army Aviation Activities

FROM FORT HOOD

Tactical ATC—It Does Work. The 4/57th Air Traffic Control (ATC) Company (FWD) located at Ft. Ord, CA, recently participated with Company B, 40th Aviation Battalion of the Arizona National Guard in a field exercise at Navajo Army Depot near Flagstaff, AZ. The 4/57th ATC is assigned to the 16th ATC Battalion, Ft. Hood, TX. The battalion has two ATC companies, the 57th at Ft. Lewis, WA, and the 68th at Ft. Sill, OK. Platoons of the battalion support continental United States divisions and one separate brigade at nine different posts in the western United States to include Alaska and Hawaii.

Purpose of the exercise was fourfold. First, the 40th Aviation Company, a roundout unit of the 7th Combat Aviation Battalion at Ft. Ord, was to conduct an ARTEP (Army Training and Evaluation Program). Second, the aviation crews were to conduct tactical instrument training, using the 4/57th for ATC service. Third, the air traffic controllers would receive additional training in the tactical aspects of their military occupational specialty. Last, air traffic control, including radar coverage, would be provided to the military aircraft operating in an area of otherwise uncontrolled airspace.

The concept of the operation for the 4/57th was to establish a tactical control tower to provide local and ground control at Navajo Army Depot, a ground control approach facility for radar coverage and precision approaches for pilot training, and a nondirectional beacon for instrument flying and landing approaches.

Training accomplished on this mission was extremely valuable to all participants. Equally important was the learning experience of National Guard and Regular Army units working and serving together. Perhaps the greatest accomplishment, however, was the realization by some and confirmation by others that air traffic control can and does function well in the field environment. Tactical ATC is indeed a viable part of the aviation community and should be totally integrated into all aviation field exercises.

LIGHTS WENT OUT OVER ALABAMA. Chief Warrant Officer, CW3(P), Jeffrey M. Swickard, operations officer, Attack Branch, Hanchey Division, Department of Flight Training, Ft. Rucker, AL, received $765 for his suggestion that the terrain board lighting be reduced from the day mode to the dusk mode for normal operations of the AH-1 Cobra and CH-47 Chinook flight simulators. First-year savings are estimated to be $18,538

photo by Yvonne Lugo

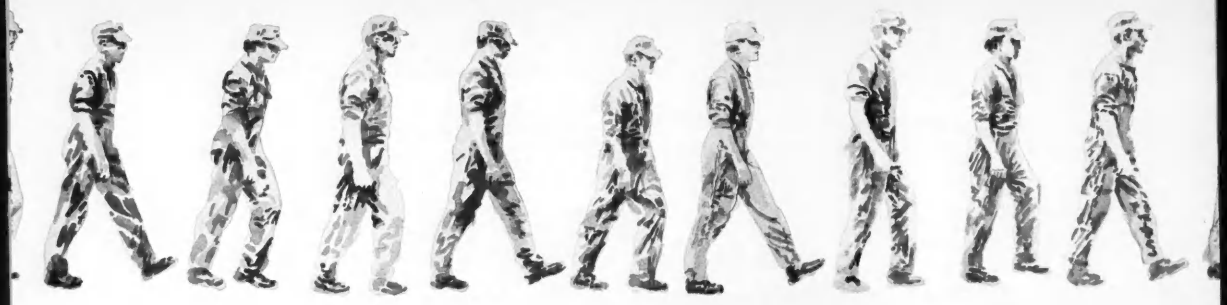
AWARD-WINNING AUTHORS. Second and third place winners in the *Army Aviation Digest* Annual Writing Contest, Major James H. Kenton, center, and Lieutenant Colonel J. W. Lloyd, right, of Ft. Rucker, AL, talk with Major General Carl H. McNair Jr., post commanding general, after receiving the *Digest's* Certificate of Achievement. Major Kenton's article, "Aviation Training in the 1980s—Another View," appeared in the April issue and Lieutenant Colonel Lloyd's (which he coauthored with Colonel E. H. Grayson), "The Aviation Commander—New Challenges During the 1980s," in November 1980. The first place winner, Chief Warrant Officer, CW3, Russell D. Capps, is assigned to Ft. Lewis, WA. His winning article, "Flight In The Twilight Zone," was published in September 1980

photograph by SPR Denise Starr

FROM CALIFORNIA

APACHE Aviators. Army aviators (above) who flew the AH-64 APACHE during its Operational Test II this summer are pictured, together with other program dignitaries, at their graduation last May: Front row, left to right, Norm B. Hirsh, vice president, AAH Program, Hughes Helicopter, Inc.; Major General Edward M. Browne, program manager, DARCOM; Jack G. Real, president, Hughes Helicopters, Inc.; Robert J. Whalen, president, Orlando Division, Martin Marietta Aerospace; and Joseph J. Halisky, director of programs, Rockwell International; second row, left to right, LTC Burl Zorn, commander, 7th Combat Aviation Battalion; CW4 Larry Proper; CW3 Russ Helton; CW2 Jim Sandberg; CPT Larry Casper, commander, D Company, 7th CAB; and CW2 Gene Coppersmith; third row, left to right, CW3 Bill Yarlett, CW4 Joe Koch, CW3 Tom Willmore, CW3 Frank Gabriel and COL Donald Wray, project manager, TADS/PNVS, St. Louis; back row, left to right, CW3 John Repcik, CW3 Denny Dvorchak, CW3 Randy Dyer and CW2 Skip King. The chief warrant officers are assigned to D Company, 7th CAB, 7th Infantry Division, Ft. Ord, CA.

SIKORSKY DONATES. The director of Government business at Sikorsky Aircraft, Gary Rast, second from left, presents the second $5,000 installment of a $25,000 pledge to retired Army Colonel Max McCullar, chairman of the executive committee, U.S. Army Aviation Museum Foundation, Inc. The two are flanked by Major General Carl H. McNair Jr., commanding general, Ft. Rucker, AL, and retired Army Colonel Jim Townsend, treasurer and a foundation director. The $25,000 Sikorsky pledged to the Army Aviation Museum Foundation fund drive is being paid over a period of 5 years. The general holds a model of the Sikorsky-built UH-60 Black Hawk, the most recent addition to the Army's helicopter inventory



AVIATION WARRANT OFFICER RETENTION

an Evaluation of Demographic Items

THE ARMY RESEARCH Institute (ARI) Ft. Rucker, AL, Field Unit, under the sponsorship of the Military Personnel Center (MILPERCEN), recently completed a project to identify the demographic and attitudinal factors which influence aviation warrant officers (AWOs) to voluntarily separate from the Army. This third in a series of four ***Aviation Digest*** articles on the AWO retention issue addresses demographic and attrition information obtained from questionnaires administered to a sample of AWOs at Army installations within the five major commands (MACOMs).

The first article (August 1981 issue) presents an overview of the retention issue and the ARI/MILPERCEN study approach. The second (September 1981) describes factors found to influence the AWO

CW2(P) Bernard T. Sundy
U.S. Army Research Institute Field Unit
Fort Rucker, AL

Dr. John Ruffner and **Mr. Daniel Wick**
Canyon Research Group

This is the third article presenting the results of an effort initiated and supported by the leaders of the U.S. Army Military Personnel Center—MG Robert Elton and MG Charles Bagnal. The Army Research Institute greatly appreciates the support and guidance provided by MG Carl McNair Jr., commanding general, U.S. Army Aviation Center, Ft. Rucker, AL. Also the following chief warrant officers from the Warrant Officer Senior Course and Advanced Course at Ft. Rucker volunteered to develop staff studies on some of the key retention topics: CW3 Homer Bentley, CW3 Donald Curtis, CW3 Jeffery Gibson, CW3 Joseph Licina, CW3 Gary Pruyne, CW3 Leroy Sweet and CW3 Carroll Vaughn. Their participation and dedication was particularly noteworthy. LTC Robert Jones and CW4 John Valaer from the Warrant Officer Career College at Ft. Rucker also provided a great deal of support on the project.

Particular recognition should go to individuals at MILPERCEN who sponsored this project and provided guidance throughout the effort: COL Arthur Bills, COL George Morgan, LTC David Carothers, CPT Mike Borland and CW4 Dick Sauer, as well as other members of the Warrant Officer Assignment Branch.

Thanks also should go to other members of Canyon Research Group which actively participated in this project: Dr. George Siering, Mr. Bruce Smith and Ms. Elinor Cunningham

decision to leave the service. The fourth article will present the MILPERCEN/DA action plan developed to aid in resolving those factors affecting AWO retention.

ARI surveyed a random sample of AWOs and all available attritees (AWOs who stated a firm intention or had initiated actions to leave the Army) at Ft. Rucker; Ft. Bragg, NC; Ft. Campbell, KY; Ft. Lewis, WA; Ft. Hood, TX; Ft. Ord, CA; Hawaii; Germany; and Korea (see figure). The third column in the figure shows company/troop commanders and platoon/section leaders surveyed for their opinion. The installations represented about 95 percent of the operational AWO population. AWO respondents were divided into the following four categories based on their stated career intention: (1) *retainee*—those who indicated an intention to remain in the Army; (2) *undecided-stay in*—those who were undecided but would probably stay in; (3) *undecided-get out*—who were undecided but would probably get out; (4) *attritee*—defined above.[1]

From this survey data, demographic characteristics were examined to help ARI/MILPERCEN understand why AWOs were leaving the service. Several characteristics which were found to be informative relative to attrition are: age, marital status, installation, source of entry, career status and track, civilian education, desire for a commission and civilian job market. The remain-

[1] Attritees were also found within the random sample group. In order to generalize to the entire AWO population, the data provided in this report is taken from the random sample group except where explicitly noted.

Glossary

ARI	Army Research Institute
AWO	aviation warrant officer
DA	Department of the Army
EUSA	Eighth U.S. Army
FORSCOM	U.S. Army Forces Command
FY	fiscal year
MACOM	major Army command
MILPERCEN	Military Personnel Center
MOS	military occupational specialty
TRADOC	U.S. Army Training and Doctrine Command
USAREUR	U.S. Army, Europe
WESTCOM	Western Command

der of this article discusses aspects of these characteristics relative to attrition.[2] The following review of the data is provided to give the reader a better understanding of the AWO population, as well as to provide an aid for the prediction of attrition and the development of policies which will improve retention of AWOs in the service.

Age. The findings of the survey suggest that AWOs who plan to leave the Army are typically younger than those who plan to remain in the Army. The average age of AWO *attritees* or *undecided-get out* was 28 years. In comparison, *undecided-stay in* AWOs had an average age of 31 years while the *retainees* averaged 34 years. It is important, however, for the reader to realize that age is related to several other factors which also affect attrition such as years of service and education level. This obvious interaction between age and other variables will be observed in later sections of this article.

Marital Status and Dependents. A larger percentage of single and divorced AWOs attrite compared to married AWOs. The *attritee* category was made up of 29 percent of the single group and 25 percent of the divorced group but only 10 percent of the married group. This could be due to the fact that *attritees* are typically younger and probably have fewer long term commitments than do the married AWOs. Also, as the number of dependents for whom an AWO is responsible increases, retention also increases. After two or more dependents, the percentage of AWOs who were identified as *retainees* almost doubled. It seems that, up to a point, the more dependents an AWO has, the more likely he or she is to remain on active duty. This in turn could be due to the fact that *retainees* are typically older.

Sample Survey

MACOM	Warrant Officer (random sample)	Attritees (all available)	Chain of Command (commissioned officers)
USAREUR	199	18	105
EUSA	81	13	38
WESTCOM	47	14	24
FORSCOM	314	83	123
TRADOC	116	13	30
TOTAL	757	141	320

Installation. The installation or factors associated with the installation are often thought to influence the decision to separate from the Army. AWOs were asked to indicate their three most desired as well as three least desired installations. The three most desired installations were Ft. Carson, CO, Ft. Lewis and Ft. Rucker. A number of different reasons were given for the preference of these installations. Some examples of these reasons were: good relations between military and civilian residents of the community, favorable command policies toward aviators and importance of AWOs at the installation.

On the other hand, the three least desired installations were Ft. Bragg, Ft. Campbell and Ft. Hood. Again, a wide variety of reasons were given for nonpreference of these installations. Some examples of these were: extended periods of field duty and large AWO population at commands where aviation issues are not a major priority.

The survey also provided a more direct evaluation of this area by asking all AWOs who were attriting to indicate the amount of influence their current permanent change of station assignment had upon their decision to attrite. The research findings indicated that, even though 38 percent stated that the assignment had little or no influence on their decision to leave the Army, 21 percent stated that the assignment influenced their decision to a moderate extent. The remaining 41 percent stated that the assignment influenced their decision to a great or very great extent. These figures indicate that a large percentage of the AWO attritees had some degree of dissatisfaction with their assignment.

Source of Entry. Entry into the aviation warrant officer flight training program at the Aviation Center can occur primarily from either civilian or enlisted service status. A commonly held belief regarding source of entry is that AWOs who entered from enlisted service status are more likely to remain in the service than those who entered from civilian status. Examination of the survey data from the random sample group indicated that of those who entered AWO service 46 percent were civilian entry and 46 percent were prior Army enlisted service. The retention and attrition percentages for civilian entry and enlisted entry groups were very close (about 20 percent *undecided-get out* and *attritee* for both entry sources). These data suggest no

[2] None of the variables discussed in the article "cause" attrition. These variables are examined in order to understand the attrition problem and determine the factors associated with attrition or retention.

retention advantage to giving selection preference to AWOs from prior service status.

Career Status and Track. The data generally indicated that once AWOs had been assigned a career track (safety, operations and training, or maintenance) or had become voluntary indefinite, their retention rate increased significantly. The highest attrition is projected for the obligated volunteer (OBV) AWOs, of whom 26 percent fell into the *attritee* group and 32 percent indicated that they were *undecided-get out.*

As well, the research indicated that 63 percent of the AWOs (and 54 percent of those within the random sample intending to separate) said that they had not been personally counseled with regard to their career intentions in the preceding 12-month period. Increased concern for the AWO through additional career counseling (especially during the obligated volunteer stage) could possibly improve the percentage of AWOs remaining in the service. In other words there may be a great deal of credibility to the popular expression, "Ignore your Soldiers and they will go away."

In addition, it is of interest to note that the administrative paperwork required to extend for an additional tour of duty is more extensive than the paperwork required to separate from the service at the end of an initial obligated tour. It seems that small administrative improvements might facilitate the retention of AWOs.

Civilian Education. One question asked prior to the initiation of the project was, "Is education level related to attrition?" The data indicated that the more years of formal civilian education an AWO has, the more likely it is that he or she will remain on active duty. Of those who have no more than a high school education, 28 percent stated their intent to attrite, as compared to 16 percent of those AWOs with some college, 7 percent of those with an associate degree and 14 percent of those with a bachelor's degree.

These data also appear to be related to age. The Army seems to be retaining, at higher percentages, individuals who are older and have had a chance to attain higher levels of education than the younger AWOs.

Desire for a Commission. Some AWOs want a "ladder to climb" when they look ahead for career options and alternatives. When asked whether they would accept Officer Candidate School (OCS), 9 percent of the sample said "yes." Also, when asked if they would accept a direct commission, 37 percent said "yes." Of the AWOs who would take a direct commission, 54 percent would accept rank no less than captain, 41 percent would accept no less than first lieutenant, and 4 percent would accept second lieutenant. This preference for a direct appointment rather than OCS appears to support the perception that flight school is also an "officer candidate" school; therefore, the AWOs may feel that they have "paid their dues."

It is true that approving commissions for selected AWOs may appear to have the initial effect of decreasing AWO retention. However, in the long run it probably will benefit both the warrant officer and the commissioned officer ranks. The AWO with the proper experience and qualifications also would be afforded the opportunity to seek different responsibilities and a new career path. In other words, the Army could provide the potential for career changes with more supervisory responsibilities by offering commissions to AWOs who are interested and qualified. Therefore, the actual loss to the warrant officer group might be relatively small.

Civilian Job Market. An established perception which exists is that AWOs who choose to leave voluntarily are leaving for better paying civilian aviation jobs. When asked whether or not they had a firm job waiting after their separation, 25 percent of the approximately 200 attriting AWOs who responded to this question answered "yes." Of those 50 *attritees,* 25 were leaving for civilian aviation positions, 2 for other military service, 6 for civilian aviation related nonflying positions, while 17 were leaving for civilian nonaviation positions. The locations of these jobs were: hometown area—44 percent; local area of last assignment—16 percent; and areas away from hometown and last assignment—40 percent. Also, of those who had firm jobs waiting, 48 percent of the group stated the average annual salary would be between $22,000 and $28,000, with another 22 percent more than $28,000 a year. Of the 75 percent of the *attritees* who answered "no" to the firm job offer question, 85 percent said they would seek aviation employment after leaving the service.

This article has discussed several demographic characteristics related to the AWO retention problem. Like the preceding two articles, the purpose of the present article was to share some of the results of the ARI/MILPERCEN investigation of this problem. The intent was not to offer solutions, but to identify where problems may lie and where changes may be effective.

The solutions are not going to be easy nor will changes take place overnight. It is up to all of us to work toward changes that will improve the AWO corps and AWO retention.

The last article in this series will present the MILPERCEN/DA action plan addressing the AWO retention issue. Anyone interested in obtaining copies of the first two articles should write editor, ***Aviation Digest,*** P.O. Drawer P, Ft. Rucker, AL 36362.

What Meets The The Eye . . . Real or Illusion?

"Human error" and "approach and landing" are phrases frequently used in describing causes of aircraft accidents. Statistics reveal that about 80 percent of aircraft accidents involve human error as a contributing factor. In addition, about 50 percent of all accidents occur during the approach and landing phase.

Your primary role in the cockpit is making decisions. In order to do this you must sense and process information. Potential sources of error range from limitations in your senses and perceptual mechanisms to inadequacies in procedures and methods prescribed for the flight crew. This article will briefly present some characteristics related to sources of information processing error during the approach and landing.

Your senses receive physical stimuli and encode information; perception interprets information and attaches meaning to it. Most of the information which you receive comes to you through your eyes; some comes from instrument displays in the cockpit, but a large amount is obtained from outside the cockpit, often under conditions which may be far from ideal. Indeed, certain conditions may prevent the necessary information from ever reaching the eye. More often a signal reaches the eye but the brain misinterprets and you "see" something else; in other words you experience a visual illusion. We will discuss only the illusion, or false perceptions, associated with direct vision.

Visual illusions are potentially common in flying and result from the incorrect interpretation of what you see. This may be due to there being too few visual cues so that you have to fill in the rest of the picture by drawing on your preconception of the situation, by "seeing" what you think you "ought" to see, or simply by guessing. It may also occur when cues presented to the normally master sense, vision, are weak and are in conflict with relatively strong responses by other senses, particularly those of balance and orientation, which have sensors in the inner ears.

The purpose of this article is to draw your attention to some of the circumstances in which visual illusions may be experienced and to the hazards which the illusions may introduce on the approach to land. Increased awareness of these factors will enable you to recognize and compensate for most visual illusions and so reduce the risk of an accident.

Visual illusions during the landing approach may be caused by one or any combination of the following features:

- Sloping approach terrain
- Sloping runways
- Runway width
- Rain on the windscreen
- Featureless approach terrain
- Runway lighting intensity
- Shallow fog
- Rainshowers
- Darkness
- Black hole effect

Sloping approach terrain

Normally, when a pilot makes a visual approach he subconsciously judges the approach path from a combination of the apparent distance of the aircraft from the runway and its apparent height above the approach terrain. If the ground under the aircraft slopes upwards towards the threshold, an illusion may be created, particularly during the early stages of the approach, that the aircraft is too high (see figure 1). Conversely,

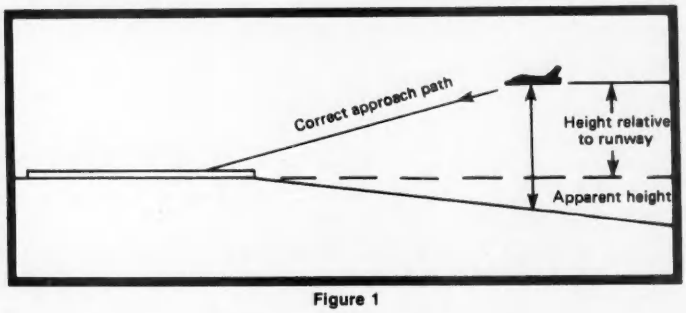


Figure 1

ground which slopes downwards towards the threshold gives the impression that the approach path is too flat (see figure 2).

Sloping runways

Through the regular use of ILS glide paths and VASIs, with three-degree glide slopes, pilots become accustomed to the complementary angle of 177 degrees between the runway and the approach path (see figure 3). Additionally, from experience, pilots come to know with considerable accuracy the amount of power required to maintain the correct approach path to the point of touchdown. If, however, the runway slopes upwards from the landing threshold and the 177-degree relative angle is maintained, a visual approach will be lower than it should be, by about the same amount as the runway upslope, and the "usual" power setting will be inadequate to meet the requirements of the flatter approach. If the runway has a downslope, the converse applies, so that by maintaining the 177-degree angle relative to the downsloping runway, the approach to the touchdown point will be steeper and the "usual" power setting in excess of that required.

Runway width

The ability to use the apparent convergence—due to perspective—of two parallel lines to estimate their length is well known. Increasing or decreasing the distance between the lines, however, can create the illusion of shortening or lengthening them. On the approach, a pilot bases part of his judgment on a mental comparison of the runway before him with the "normal" view of the runway to which he is accustomed. Variations in the runway width, therefore, can be

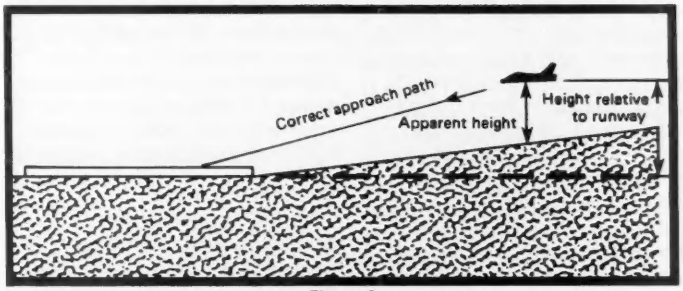


Figure 2

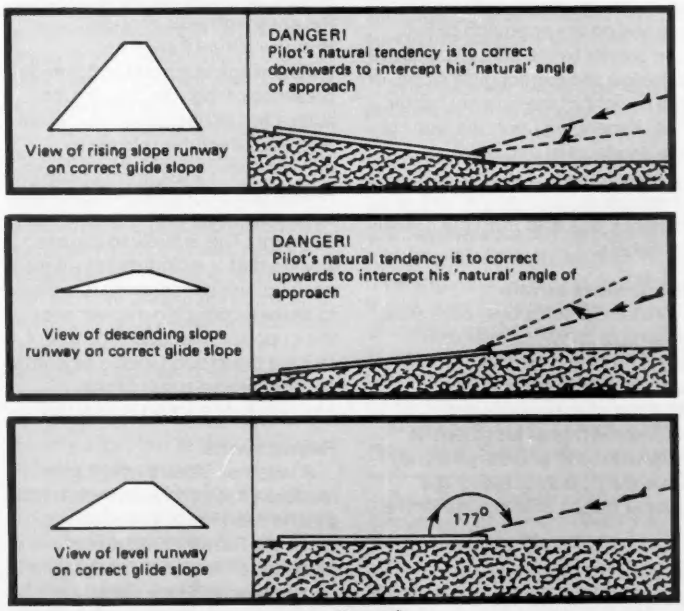

View of rising slope runway on correct glide slope
DANGER!
Pilot's natural tendency is to correct downwards to intercept his 'natural' angle of approach
View of descending slope runway on correct glide slope
DANGER!
Pilot's natural tendency is to correct upwards to intercept his 'natural' angle of approach
View of level runway on correct glide slope
177°

Figure 3

misleading. For example, the wider the runway, the shorter it appears; moreover, the width can also have an effect upon the apparent height of the aircraft in relation to the runway, a wider runway making an aircraft appear lower than it is.

Rain

Heavy rain can affect the pilot's perception of distance from the approach or runway lights by diffusing the glow of the lights and causing them to appear less intense. This may lead him to suppose that the lights are farther away than in fact they are. On the other hand, only a little scattering due to water on the windscreen can cause runway lights to bloom and double their apparent size, with the result that the pilot believes that he is closer to the runway than he actually is, leading possibly to a premature descent. Similarly, rain on the windscreen can cause illusions as a result of light ray refraction. For instance, even though an aircraft is correctly aligned on the approach path it can appear to the pilot to be above or below the correct glide slope, or left or right of the runway center line, depending upon the slope of the windscreen and other circumstances. The apparent error might be as much as 200 feet at a distance of 1 mile from the runway threshold.

Featureless terrain

Visual descents over calm seas, deserts or snow, or over unlit terrain at night, can be hazardous even in good visibility. The absence of external vertical references makes judgment of height difficult and the pilot may have the illusion of being at a greater height than is actually the case, leading to a premature or too rapid descent. Height above the runway is also made more difficult to judge if, because of snow for example, there is no contrast between the runway surface and surrounding terrain. The problem is compounded if the descent is made into the sun or in any conditions which reduce forward visibility.

Runway lighting intensity

Because bright lights appear closer to the observer and dimmer lights farther away, the intensity of the approach and runway lighting can create illusions. Thus, on a clear night, the runway lights may appear closer than they actually are, particularly when there are no lights in the surrounding area.

Shallow fog, haze

In shallow fog or hazy conditions, especially at night, the whole of the approach and/or runway lighting may be visible from a considerable distance on the approach even though Runway Visual Range or meteorological reports indicate the presence of fog. On descent into such a fog or haze layer, the visual reference available is likely to diminish rapidly, in extreme cases reducing from the full length of the approach lights to a very small segment. This is likely to cause an illusion that the aircraft has pitched nose up, which may induce a pilot to make a corrective movement in the opposite direction. The risk of striking the ground with a high rate of descent as a result of this erroneous correction is very real.

Rainshowers

A weather feature which may reinforce a pilot's visual indications that he need not apply power to reach the runway or to arrest a high rate of descent is an isolated rainshower. A heavy rainstorm moving towards an aircraft can cause a shortening of the pilot's visual segment—that distance along the surface visible to the pilot over the nose of the aircraft. This can produce the illusion that the horizon is moving lower and, as a result, is often misinterpreted as an aircraft pitch change in the nose up direction. A natural response by a pilot would be to lower the nose or to decrease, not increase, power.

Darkness

The greatest confusion potential exists at night. Darkness provides excellent camouflage and the eye loses much of its efficiency. Normally used cues such as shadows, color and detail are not available. Lights must compensate for this loss, but lights usually lack sufficient definition to provide more than an outline, an incomplete stimulus to which the pilot may or may not react correctly. At the other end of the scale we have a profusion of lights. Large airfield complexes have so many lights that frequently there is considerable difficulty experienced in just finding the runway.

Black hole effect

This illusion can occur on a clear night with no visible horizon. The aircraft approaches the runway over the sea or other featureless, unlit terrain towards an aerodrome with bright city lights behind it. Visibility is so good that there is little need to rely on the instruments except to check the airspeed. The straight-in approach is totally uneventful until the aircraft lands short of the runway, possibly by several miles. What could have gone wrong?

Tests have shown that under these circumstances a pilot relying

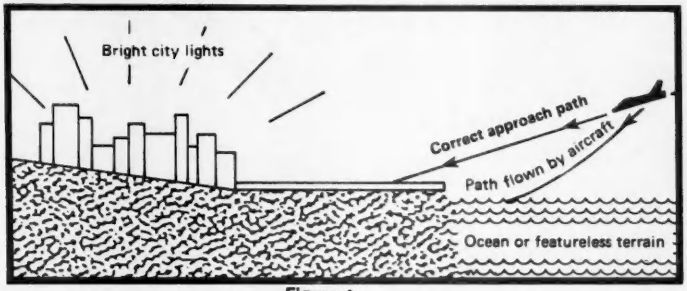


Figure 4

on a visual approach will tend to fly along the arc of a circle centered above the pattern of city lights with its circumference contacting the terrain. Such a path results from maintaining a constant visual angle subtended at the eye by the nearest and farthest city lights. When deceptive conditions are present, such as upsloping city terrain, this kind of approach path can go to critically low altitudes. The lack of foreground lighting results in the pilot being denied important closure information without his awareness and consequently the aircraft lands short.

Avoiding the problem

Be aware of the circumstances in which visual illusions may occur and be prepared to take corrective or alternative action. Learn to recognize impending situations which may place the safety of the aircraft and its occupants in jeopardy.

Study aerodrome charts, maps and other applicable reference material to determine runway slope, the slope of terrain around the aerodrome, the relative position of the aerodrome and surrounding features, the aerodrome approach and runway lighting in use, etc., etc.

Anticipate the need for rain repellant on the windscreen and use as appropriate, before departure.

Wherever available use ILS or VASI to monitor the glide slope. If a DME is located at the aerodrome use the "rule-of-thumb" 300 feet per nautical mile for your descent profile, but remember to take into account the relationship of the DME beacon to the threshold of the runway in use.

If the nominated runway has no precision approach aids, consider the need to request an alternative runway with precision aids. When no precision aids are available fly a full circuit, never a straight-in approach. The aircraft can be more accurately positioned at 600 feet on a 2-mile final having flown a full circuit than on a straight-in approach without aids. It may also be possible to position the aircraft at a known point, such as over a locator, at the correct altitude and approach configuration. The pilot should then obtain a visual image of the runway and maintain this image throughout the approach. If none of the foregoing procedures are possible, consideration should be given to diverting to a more suitable aerodrome.

On two-pilot operations use the monitored approach technique. One pilot flies the instrument approach while the pilot who is to land the aircraft monitors the approach and gains "experience" of the ambient conditions before taking over control.

During single-pilot, IFR operations the pilot should use the autopilot as the pilot flying the approach. While flying a coupled approach, the "real" pilot should try to gain experience of the conditions. The autopilot should remain engaged as long as possible until the pilot has obtained a good visual picture, and a safe landing is assured.

On all operations, avoid landing expectancy; be prepared to go around or carry out a missed approach if there is any doubt about the safety of the landing.

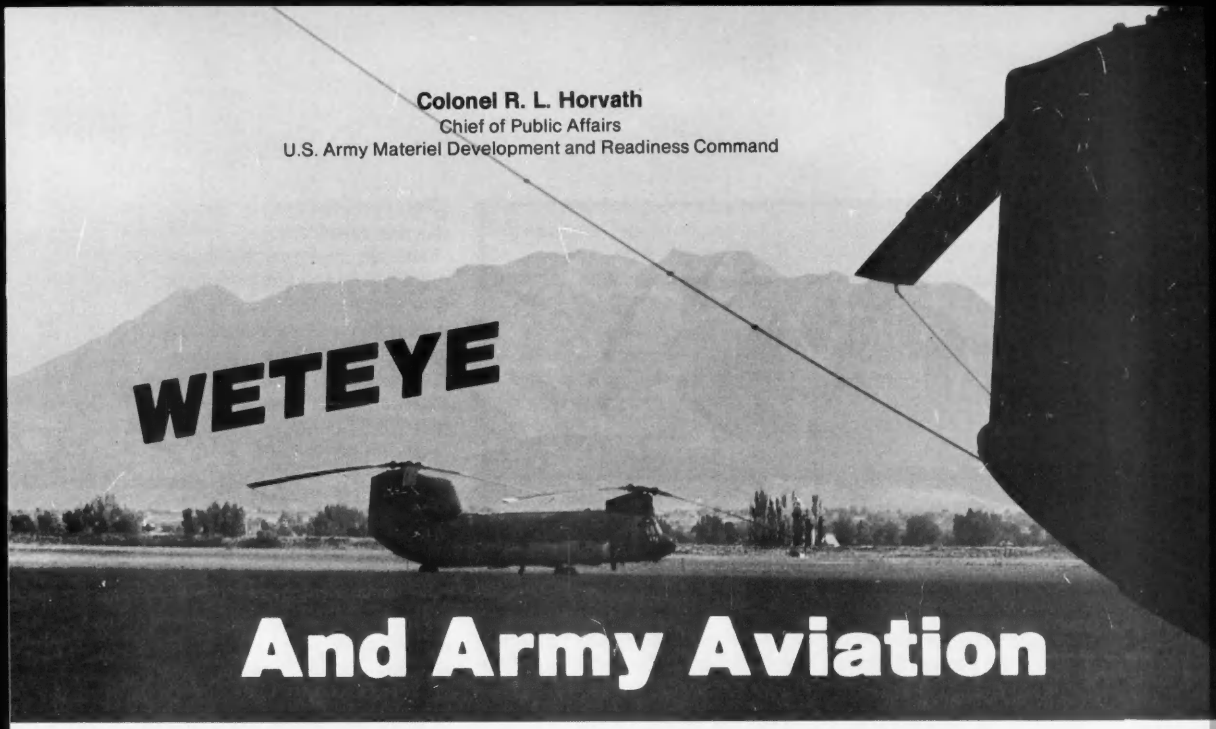
Wherever possible, pilots should receive training flights to aerodromes where it is known that conditions can be conducive to visual illusions.

In conclusion, remember that illusions must be expected in flying; also that it is human nature to want to believe our own senses rather than instrument indications. Knowledge of illusory sensations will help because our responses are determined more by the meaning we attach to stimuli than by the stimuli themselves. It is ultimately on the basis of knowledge and self-discipline that we make decisions and select our responses.

How sharp are your eyes? Did they catch **the the** title?

—from **Flying Safety** and Department of Transport Australia **Aviation Safety Digest**

Colonel R. L. Horvath
Chief of Public Affairs
U.S. Army Materiel Development and Readiness Command



WETEYE And Army Aviation

THEY WERE READY, ready and waiting each morning at 0400. But they were never required to perform their assigned mission.

"They" were four emergency response teams (ERT) located along the air route from Stapleton International Airport in Denver, CO, to Michael Army Airfield at Dugway Proving Ground, UT.

They were part of the 1,000 man and woman WETEYE Task Force commanded by Brigadier General Walter Kastenmayer that operated in Colorado and Utah during the transfer of 888 nerve gas bombs and three 1-ton containers. The Task Force mission—to transfer the chemical materiel from Rocky Mountain Arsenal in Colorado to Tooele Army Depot in Utah.

The backbone of the teams was the CH-47 Chinook helicopters and their crews. They would have responded to a crash of the C-141 Air Force jet Starlifter that flew the 15 sorties from Stapleton to Michael. The Chinooks were also prepared to carry the necessary chemical decontamination equipment to the crash site.

Each of the ERTs had three Chinooks and crews assigned plus Army technical escort personnel, security personnel, medical personnel and a public affairs representative—a total of 29 men and women including the flight crews.

Two additional response teams were located at Buckley Air National Guard Field in Denver and at Michael Army Airfield.

The game plan went like this. All of the ERTs were ready at 0400 each day that flights were scheduled from Denver to Michael Army Airfield; equipment was loaded and crews were on standby. If a C-141 went down, the nearest ERT would respond with the remainder of the teams serving as backup. Their

Fortunately the biggest problem was boredom (Craig, CO, ERT shown) which was alleviated by open house for local residents

mission was to get to the site fast, survey the situation and immediately initiate emergency procedures.

The 15 sorties flown on 9 days in August went like clockwork. The ERTs were never ordered to carry out their mission.

Major Bill Goforth of the Army Technical Escort Unit (TEU) at Edgewood Arsenal, MD, directed the activities of the ERTs from the Rocky Mountain Arsenal Command Center. He was assisted by Major Howard Foster, the operations officer of the 14th Combat Aviation Battalion, Ft. Sill, OK. The 14th Battalion is commanded by Lieutenant Colonel Allan F. Jones.

Majors Goforth and Foster were linked to all of the response sites by lift-to-talk phones providing the task force commander instant contact with the ERT commanders.

The command relationship at each ERT was unique in itself. The senior aviator was responsible for the aviation assets while the senior TEU officer took care of the remainder of the assigned personnel.

The 178th Aviation Company (ASH) from Ft. Sill, commanded by Captain Bruce Grable, had a unit at Buckley in Denver and Craig, CO, and Michael Army Airfield.

The 179th Aviation Company (ASH) from Ft. Carson, CO, attached to the 14th Battalion for the operation, is commanded by Major Dennis Pfaltzgraff. His unit was deployed at Provo and Vernal, UT, and Kremmling, CO. Additionally, the 179th provided a maintenance team which was stationed at Vernal.

Fortunately, the biggest problem at the ERT sites was boredom which was alleviated by a preplanned community relations effort. Open houses were held at each of the four en route sites. Many town residents at the response sites had never seen a helicopter. These open houses met with great success and afforded the opportunity of solid support for the teams.

Sporting events and speaking engagements were scheduled with various local groups by the onsite public affairs representative. During the planning phase for the operation, liaison teams from the task force briefed civic leaders at each locale for the ERTs.

The Task Force Public Affairs Officer was furnished three Army helicopters. These aircraft were from the 200th Aviation Company, a III Corps Aviation unit from Ft. Sill, commanded by Major Raymond J. Stavinoha. They were used for security purposes to preclude civilian news media rotary wing aircraft from flying during the convoy portion of the operation.

The senior aviator at this operational site in Salt Lake City, UT, was Captain Bill Powell.

Captain Powell's aircraft ferried more than 75 newsmen from Tooele Army Depot North Pad. The aircraft flew the convoy route that followed the old Pony Express Trail over Lookout Pass from Dugway to Tooele Army Depot South Area where the WETEYE bombs are now in long-term storage.

Boredom was also a problem for these aviators. The Task Force Public Affairs Team capitalized on these crews' spare time by providing orientation overflights of the entire overland convoy route for the more than 100 law enforcement personnel who supported convoy operations.

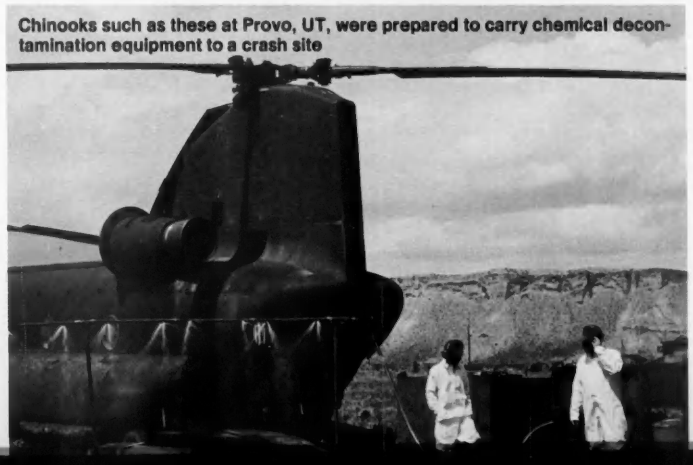
Finally, fixed wing aviators got into the act as a C-12 Huron from U.S. Army Armament Materiel Readiness Command (ARRCOM) served as a chase plane while the C-141s were in the air.

The mission assigned to this aircraft crew was to fix the exact location and serve as the air command post until the response ERT was on the ground at the crash site in the unlikely event that a Starlifter went down. Mr. Neil Pobanz and Major John Berry of ARRCOM were the crewmembers of the C-12 chase plane.

Major Foster summed up the performance of the aviators assigned to the WETEYE Task Force this way: "They were always ready to launch. It was the dedicated and concentrated efforts of the maintenance personnel and the operational aircrews that kept the aircraft ready. Although the 178th and 179th had never worked together on this type of a support operation, it was largely through their technical competence, cooperation and professionalism that they were always ready to react on a short notice."

WETEYE AVIATION ASSIGNMENTS

ERT SITE	UNIT	SENIOR ADVISOR
Provo, UT	179th AVN Co. (ASH)	MAJ Dennis Pfaltzgraff
Kremmling, CO	179th AVN Co. (ASH)	CPT Terry Hargrove
Vernal, UT	179th AVN Co. (ASH)	CPT Walter Schumacher
Buckley Airfield, CO	175th AVN Co. (ASH)	CPT Bruce Grable
Craig, CO	175th AVN Co. (ASH)	CPT Earl May
Michael Army Airfield, UT	175th AVN Co. (ASH)	CPT Roger Matthews
Vernal, UT	179th AVN Co. (ASH)	CW3 Clifford Richmond



Chinooks such as these at Provo, UT, were prepared to carry chemical decontamination equipment to a crash site

Synthetic Flight Training System Program

Lieutenant Colonel John J. Griffiths

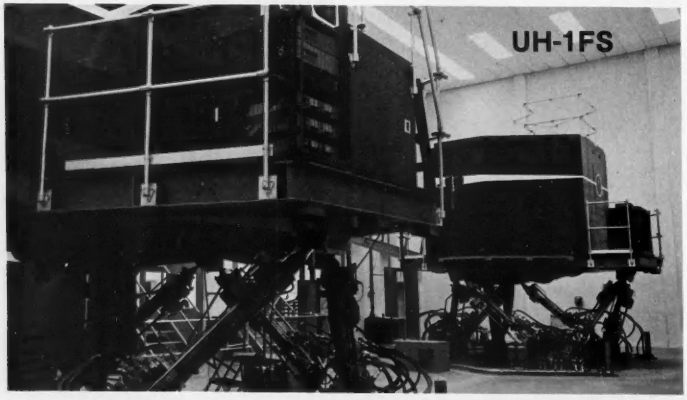
Director for Plans and Systems Analysis
Troop Support and Aviation Materiel Readiness Command
St. Louis, MO

DURING MY PREVIOUS assignment as U.S. Army Troop Support and Aviation Materiel Readiness Command's (TSARCOM's) readiness project officer (RPO) for the synthetic flight training system (SFTS) program, I had the opportunity to become associated with an interesting, important and dynamic program.

What is well known within the Army and Department of Defense (DOD) circles is that contracts have been awarded to the Link Division of The Singer Company through competitive source selection meetings. This company has a modern generation of training devices for the wide variety of utility and combat helicopters. What may not be quite as familiar is that Link has provided a total support structure for these SFTS devices through initial fielding, development and operational test, and production deployment. Having overall responsibility for the support of fielded equipment, it has been TSARCOM's mission to develop the procurement and technical interface between the Army and Link and to monitor the support program's performance through the past 5 years.

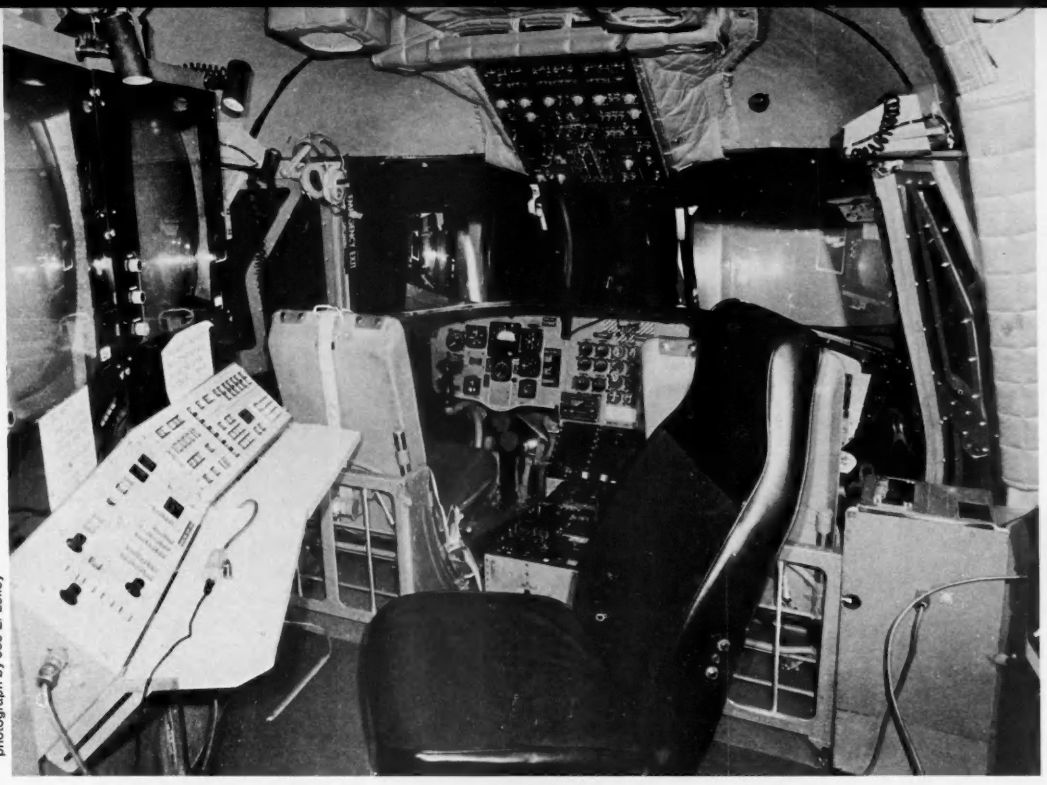
During this time, the program has been subjected to steady growth to what has become a worldwide support network of significant size, providing all levels of maintenance and logistics support. There are currently 22 UH-1FS Huey simulators in operation. Seven are at the Army Aviation Center, Ft. Rucker, AL, the aviation training post; and 15 devices are located at separate posts both in the United States and overseas. In addition, the support program covers the prototype devices for the CH-47FS Chinook, AH-1FS Cobra and UH-60FS Black Hawk training systems at Ft. Rucker.

Over the years, there have been several occasions which could be cited as representative of why the program has achieved a reasonable degree of success. I have chosen to briefly document the most recent instance as a typical example of what can be achieved through a program of this nature.



In developing the basis of issue plan (BOIP) for the UH-1FS Huey simulator back in 1973, the program envisioned up to 30 UH-1FS devices deployed at Army Aviation sites in accordance with the aviator population. Funding limitations restricted the production to 22 devices. With the shortfall, the tail end of the deployment schedule was deleted. Since the final two devices of the original BOIP were scheduled for Ft. Rucker, the limitation caused a potential problem at this aviation training post. Ft. Rucker was left with 6 devices containing 24 trainer cockpits as compared to the 8 devices and 32 cockpits originally planned. When the entry level aviator training requirement increased as projected, the existing devices at Ft. Rucker were pushed into longer operating days and weeks. Coincidentally, it was recognized that some devices at the operational bases were being employed less than forecast because of changing patterns in aviator strength requirements. Hence, an apparent problem. A quick shift in training device availability was required.

Simulation devices are basically considered fixed-base items. Once installed, there would be little reason to move them during their life cycles. Over the years, there have been various attempts at making these training devices more mobile. Some have been packaged in trailers and others in railroad cars. However, in



photograph by Joe E. Lolley

CH-47FS

the days when simulators were driven through the use of special purpose analog computers, space limitations created significant packaging problems with the associated detriment in reliability and maintainability characteristics when later reinstalled. Digital technology has greatly reduced the packaging problems, but at the same time it has created the need for a more stable controlled environment. Thus, today's simulators are generally installed with the intent of being a fixed-base item.

This background leads to the basic problem which the Army faced in September 1979. Within about 3 months, the training requirements at Ft. Rucker would exceed its capability unless a UH-1FS device could be repositioned and placed into the operational inventory by 7 January 1980. It was here that a dividend of having the original equipment manufacturer as the ongoing support contractor was realized. Through close coordination and planning with the SFTS RPO at TSARCOM, a basic plan and responsibility definition were conceived. This initial planning was discussed during the final weeks of fiscal year (FY) 1979; and through some priority contract action, a letter contract with available FY 1979 funds was developed.

The basic division in responsibility was laid out as follows: Link—disassemble and pack for shipment; Government—ship via Government bill of lading from Ft. Eustis, VA, to Ft. Rucker; Link—reassemble and make ready for Government acceptance, and Link—provide overall supervision and retain responsibility for the total effort. The schedule was developed to meet a need date at Ft. Rucker of 7 January 1980. Since the contractual authorization was executed on 30 September, there remained just more than 3 months to organize and execute this task.

As the leader in the industry throughout the past 50 years, Link certainly has gained much experience in the movement of simulation devices of all sizes and complexities; but somehow, this challenge was somewhat unique. Any front-end planning was limited because of the short notice of the requirement. The fact that the device had been in service for more than a year and was still engaged in aviator refresher training up to the last minute also presented a new set of conditions, with which to deal.

After a crew of field engineering and manufacturing personnel from Link's home plant in Binghamton, NY, was assigned, the initial task was to determine a baseline for simulator configuration and performance. Since acceptance, the device had undergone a series of minor modifications which had been made to improve overall reliability and safety factors. Since the software had been under the control of the

AH-1FS

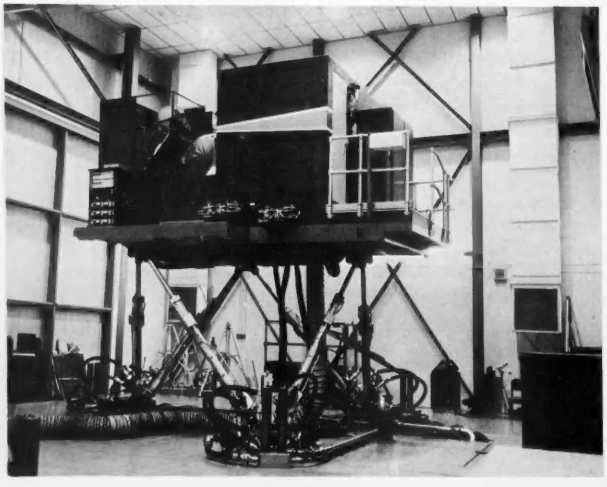
U.S. Army, the original test guide was rerun to establish a performance baseline. This rerun was monitored by quality assurance personnel from the Directorate of Industrial Operations at Ft. Rucker and established the reacceptance criteria. Immediately upon completion of the establishment of this baseline, the disassembly of the UH-1FS commenced. Through coordination between TSARCOM's RPO office and Link's manufacturing representatives, a moving firm was chosen and arrangements were concluded by the Government's transportation agency.

The UH-1FS helicopter flight training system includes four cockpit trainee stations mounted on 5-degree-of-freedom motion systems, an instruction station and a high-speed digital computer. Two flatbed trucks and three vans were employed to move the device the 700 or so miles from Ft. Eustis, VA, to Ft. Rucker. The flatbeds made two trips each to accomplish the task. The reassembly task was being performed, to the maximum degree possible, along with the packing and shipping at Ft. Eustis. Within a 4-week period, the Link team operated at both sites, and before the end of October the total UH-1FS device had been moved to Ft. Rucker with the preliminary installation work accomplished. The task at Ft. Rucker was somewhat optimized since the simulator building had been originally built to house eight UH-1FS devices and only the original six were in place. Therefore, power and environmental requirements had been previously considered.

To ensure maximum efficiency of the reassembly process, each connection of the device was labeled and coded during disassembly. Through this procedure, the pieces were refitted with zero room for error or misplacement. Power was reestablished on the device by mid-November, and complete installation, recheck and acceptance were accomplished prior to the 7 January need date. The effort was completed on time, using less than one-half the budget set aside for this purpose. This result was even more significant since it was accomplished without the major impact typically caused by the Christmas holidays.

As I stated earlier, this article was written primarily to recognize a job well done. The SFTS support effort has pioneered and proven the viability of the contractor support concept under an end item, performance oriented contract vehicle. The overall success of this program in meeting its availability and reliability goals could be the subject of another article of this nature. The efficient move of the UH-1FS device from Ft. Eustis to Ft. Rucker was just one instance of the flexibility and dedicated performance the Army has realized from the support program.

UH-60FS



THREAT

Major Frank E. Babiasz
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Fort Rucker, AL

The Leak In The Soviet Air Defense Umbrella

WHEN ADDRESSING the threat to United States scout and attack helicopters on the modern battlefield, Soviet air defense is undoubtedly the first area of discussion. There is no doubt that the highly mobile Soviet air defense umbrella is a formidable threat to low, medium and high flying aircraft extending far beyond the forward line of own troops (FLOT). They have incorporated a vast array of air defense systems into their division structure capable of providing immediate action against any airborne aggressor. Air defense systems found within a typical motorized rifle division are 120 SA-7 Grail, 16 SA-9 Gaskin, and 20 SA-6 Gainful or SA-8 Gecko missile systems and 16 ZSU-23-4 antiaircraft weapons. Employed in depth, they protect the division against attack by aerial targets.

Their air defense system is quite impressive and most definitely is a threat to Army tactical aviation. I believe, however, that the air defense threat to our scout and attack helicopters in the nap-of-the-earth (NOE) environment is overplayed, giving Army aviators a distorted picture. A close look at Soviet air defense system capabilities, as they relate to our present doctrine, will point out some significant deficiencies.

In order to understand air defense capabilities, we must first understand the target he is attempting to hit. This is where the major disconnect lies, for helicopters are viewed only as airborne targets. The helicopter is a relatively sophisticated piece of machinery with the unique characteristic of being able to attain forward flight at altitude as well as remaining airborne, but stationary, a foot above the ground. Therefore, the helicopter is not only an airborne target, but when in the NOE mode, a ground target, not highly susceptible to Soviet air defense acquisition. The present tactics of our scout and attack helicopters place them in this stationary (15 knots airspeed or less) mode a majority of the time

while performing reconnaissance and attack missions. Will they be at 100 feet of altitude anywhere near the FLOT? Of course not. Then, why do we place them in the same threat susceptible category as the Air Force A-10 Thunderbolt and other close air support aircraft. The helicopter's unique capabilities make it a unique type of target. When we consider the threat to Army tactical aviation, we must remember the target presented by an exposed helicopter. For illustrative purposes see the photographs on page 35 and below; do these represent airborne targets? Before we look at Soviet air defense capabilities, I must re-emphasize the type target the helicopter, in the NOE mode, realistically represents. It is a highly mobile ground target capable of low to medium altitude flight, but employed similarly to a tank or armored personnel carrier without regard to the type terrain or trafficability.

So what are the capabilities of the Soviet air defense forces? Let's start with their two infrared guided missiles, the SA-7B and SA-9. The SA-7B is a man-portable, shoulder fired, low altitude, surface-to-air missile. The improved SA-7B has a slant range of about 5 kilometers (km) and depends on its ability to lock on to the heat source of the target for guidance. There are about 120 SA-7s per motorized rifle division, or one per platoon. The system, and abundant numbers, may seem impressive but it also has several limitations. First of all, the SA-7s are manned by the infantry who normally fire the missile from the vehicle hatch (BMP, BTR-60 or BMD) or standing or kneeling when dismounted. The gunner is, therefore, susceptible to suppressive fires, obscurations and must also have line of sight to the target. Most importantly, he must first visually acquire the target. Considering Soviet doctrine of rapid movement and a high speed offensive, it will be very difficult for the gunner to acquire a hovering helicopter, properly masked at standoff ranges. If U.S. artillery forces the crew to "button up," the SA-7 threat will be minimal. Additionally, the new infrared (IR) jammer, IR paint and hot metal plume suppressors will add further survivability for the aircraft crew by lowering the IR signature.

The SA-9 Gaskin is a short range, low altitude, air defense system very similar to the SA-7, as it is a passive infrared missile, subject to the same restrictions as the Grail missile system. Again, the optical acquisition is a major drawback. Open source literature indicates a minimum engagement altitude of 20 meters, well above the altitude of NOE helicopters. The operator is alerted to a target by a surveillance data link, then tracks the target optically through a large window at the base of the launcher pedestal. Considering the SA-9 is employed 1 to 3 km behind the leading tanks, it's difficult to imagine optical acquisition of NOE helicopters almost 4 km on the other side.

Each Soviet division has an antiaircraft regiment consisting of 20 SA-6 or SA-8 air defense missile systems. The SA-6 Gainful is a two-stage, low altitude, surface-to-air missile with radio command guidance and semiactive radar terminal homing. The SA-6 always has been addressed as a significant threat to Army Aviation; and although a capable low altitude system, it is one which I find difficult to take seriously against helicopters. First, the minimum effective altitude of the system is about 100 meters, well above that of hovering helicopters. Second, the realization of the Soviets firing a two-stage missile, more than 19 feet in length with a 125-pound warhead, at an OH-58 Kiowa is a classic case of overkill.

The SA-8 Gecko, a single-stage, low altitude, surface-to-air missile, is a threat to Army Aviation as long as you are flying at 150 feet of altitude. The primary advantage of the SA-8 over the SA-6 is that it has its own onboard LAND ROLL target acquisition and fire control radar. Although an improvement over the SA-6, it has a limited capability to acquire hovering helicopters, is susceptible to suppressive fires and electronic countermeasures, limiting its threat to the helicopter.

Neither the SA-6 nor SA-8 were produced to counter the helicopter threat to the maneuver units. They are, however, organized and employed to protect divisional elements against the A-10 and other close air support aircraft operating within airspace in which their radar can operate effectively.

	SA-6 Gainful	SA-7 Grail	SA-8 Gecko	SA-9 Gaskin
Range (km)				
Maximum	30	3.6/4.8**	12.5	6
Minimum				0.2
Altitude (m)				
Maximum	13,000	3,500/4,500**	6,000(est)	5,000(est)
Minimum	100	45	50	20
Speed (Mach)	2.5	1.4/1.75**	1.5(est)	1.5+(est)
Guidance Principle	Semiactive Radar Homing	Passive Infrared Homing	Command	Passive Infrared Homing
Warhead	HE	HE	HE	HE
Weight (kg)	80	2.5	16-18	2.5+
Fuse	Proximity	Impact	Proximity	Unk
Missile				
Length (mm)	6,200	1,500	3,200	1,800
Span (mm)	1,520	Unk	640	300
Diameter (mm)	335	70	210	110
Launch Weight (kg)	550	9.2	180-200	30(est)
Propulsion				
Booster	Solid	Solid	Solid	Solid
Sustainer	Solid ram-jet	Solid	Solid	Solid
Missiles per Launcher	3	1+?*	4/6***	4 + 4*
Associated Radars	LONG TRACK/ STRAIGHT FLUSH	N/A	LAND ROLL	N/A
Initial Operational Capability	1967	1968	1974	1968

*Additional missiles carried in vehicle
**SA-7A/SA-7B
***Six missiles in canisters on some versions

FIGURE 1: Air Defense Missiles

Crew: 4
Basic Load (rd): 2,000
Ammunition: { HE/HEI-T, AP/API-T }
Rate of Fire (rpm/tube)
Cyclic: 1,000
Practical: 200
Maximum Range (m)
Horizontal: 7,000
Vertical: 5,100
Effective AA: 2,500
Elevation (deg): +80
Depression (deg): −7
Traverse (deg): 360
Muzzle Velocity (m/sec): 970
Vehicle: { Modified PT-76 }
Speed (km/hr): 50
Cruising Rg (km): 450
Engine: { 240 hp 6-in line Diesel }
Trench: 2,800
Step (mm): 1,100
Slope (deg): 30°
Tilt (deg): Unknown
Ford (mm): 1,070 mm

FIGURE 2: ZSU-23-4 Weapon Characteristics

(Self-propelled system, has radar-directed fire control system)

Finally, the ZSU-23-4 self-propelled gun is a serious threat to Army Aviation. Of all the air defense systems, the ZSU is a formidable threat but not without its limitations. First of all, the ZSU-23-4 has a range of 2,500 meters, less than the 3,750-meter range of the airborne TOW (tube-launched, optically-tracked, wire-guided). However, it is employed 300 to 500 meters behind the lead tanks, shortening its range accordingly. Again, the capability to detect and lock on to hovering helicopters is suspect, and, of course, the APR-39 radar warning receiver will help greatly in evading the ZSU. I believe the ZSU-23-4 is the primary threat to Army Aviation and should be the number one priority in attacking Soviet maneuver units. They are easily identified because of their profile and structured doctrine of employment—following behind the leading tanks. There are only 16 ZSUs in a tank or motorized rifle division, and their elimination early in the battle will allow attack helicopters to routinely destroy the advancing armor formations.

In summary, I am not trying to totally discount Soviet air defense but put it in its proper perspective. Of course, future Soviet air defense systems will continue to improve, and we may find that NOE may no longer provide the survivability it affords today. In the interim, the Soviet air defense network should be highly regarded, but I feel the Soviets have yet to resolve the problem of the NOE helicopter.

AVIATION PERSONNEL NOTES

Command And Staff College Selection System

THIS FIRST PHASE of a new Command and Staff College (CSC) level selection system, approved by the Chief of Staff of the Army in April 1980, will be implemented with the 1981 CSC selection cycle. The new system is intended to program officers for CSC attendance upon completion of a normal duty tour in accordance with mandated Department of Defense stabilization criteria.

Under the new procedure, selection will occur earlier in an officer's career. Officers will have four chances to be selected for resident attendance. Officers will compete only against their own year group for available seats as they do for promotion. Each year group will receive the equivalent of 1 year's worth of seats, distributed over the 4 years of their eligibility. Officers will be considered for selection during their eighth to eleventh year of active federal commissioned service (AFCS). Once selected, an officer will attend during his ninth to fourteenth year of AFCS. Of the 943 available seats, 15 percent will be selected during the eighth and ninth years, while 35 percent will be selected during the tenth and eleventh years of AFCS. Captains will be permitted to attend school.

The new system will be fully implemented in academic year (AY) 1984/1985. Between now and AY 1984/1985 the eligibility zone will be expanded. This means that during the transition an extremely large population will be considered for the same number of available seats.

The selection for command and staff level schooling is an important aspect of an officer's career. It is a goal toward which each officer should strive. The recently completed 1981 Lieutenant Colonel, AUS, CH and JAGC Selection Board again highlighted the importance of successful completion of Command and Staff College level schooling. Results reflected that irrespective of basic branch or specialty, successful completion of CSC level schooling either resident or nonresident is considered an essential ingredient of professional development and competitive career programing.

Update On Aviation Regulations

SEVERAL RECENT changes to Army regulations (ARs) have had an impact on aviation management. Aviation commanders and aviation staff officers should be aware of the recent changes in the regulations and ensure that local military personnel offices have copies of the new regulations where applicable. Significant changes/consolidations are found in:

- *AR 600-105,* "Aviation Service of Rated Army Officers," effective 1 June 1981. This regulation applies the provisions of the Aviation Career Incentive Act of 1974 to rated Army officers. AR 600-107, "Medical Restrictions and Suspensions from Flight Duty, Non-Medical Suspensions, Flying Evaluation Boards, and Flight Status Review System"; AR 600-108, "Aeromedical Consultation/In-Flight Evaluation"; and Sections I through III and those paragraphs of Section IV pertaining to flight surgeons of AR 600-106, "Aeronautical Designations and Flying Status for Army Personnel" are consolidated in this regulation. All other portions of AR 600-106 remain in effect.
- *AR 611-85,* "Aviation Warrant Officer Training," effective 15 July 1981. The revision of this regulation updates the prerequisites for entrance into the Aviation Warrant Officer Training Program; revises service obligations upon completion of training; and changes administrative processing procedures.
- *AR 611-110,* "Personnel Selection and Classification, Selection and Training of Army Aviation Officers," effective 1 September 1981. This is a complete revision of the existing regulation with significant changes throughout. The regulation updates the prerequisites for selection of officers, cadets and officer candidates for training as Army aviators.

All officers in aviation service should read and understand the provisions of these regulations. Together, they have significant impact on all members of the Army Aviation team.

New Title For Specialty Code 71

OFFICER PERSONNEL Management Specialty Code 71—Aviation Materiel Management—was retitled "Aviation Logistics" effective 1 September 1981. The new title for SC 71 is in consonance with the expansion of the specialty to a broader spectrum of functions than just life cycle management/maintenance of aircraft and components.

As a result of the expansion of the specialty, the SC 71 officer is charged with the responsibility for all facets of logistics as applied to aviation units including such functions as property books, dining facility management, procurement of all classes of supply and an expanded area of property accountability. The new specialty title follows closely on the decision to recode all aviation battalion, brigade and group S4 positions from 15A, 15B, 15C or 15D to 71A.

The title Aviation Logistics more appropriately describes the SC 71 in the multifaceted logistical role and more accurately portrays the officer's capabilities as opposed to continuing the perception that SC 71 is only aircraft maintenance. The official retitling of SC 71 has been announced in Change 11, AR 611-101 which was published 15 August 1981.

Aeroscout Instructor Pilot Techniques

Illustration by Bob McGraw

ON TODAY'S integrated battlefield, the task of the aeroscout is widely varied and complex. As aeroscout instructor pilots (IPs), the training to produce fully qualified aeroscouts is a major concern. Most aeroscout IPs have not received the benefit of a formalized school training program; yet they are tasked to train and evaluate aeroscouts in their respective units. This article will attempt to provide basic information which can be helpful in the accomplishment of this important mission.

The Aeroscout Combat Skills Handbook and Training Circular (TC) 1-137, "Observation Aircrew Training Manual," are the prime references for OH-58 Kiowa and OH-6 Cayuse tactical training. Instructor pilots should use both of these manuals to improve their tactical knowledge and to establish and maintain indepth aeroscout training programs.

As in any training program, the purpose of the training must be clearly recognized. Training should reflect the unit's mission and its assigned operational tasks. The instructor pilots must work toward these goals. To do this they must first prepare themselves to teach techniques and current procedures concerning employment of aeroscouts on the modern battlefield. Let's discuss some of these to get an idea of what is required.

To begin with, for an instructor pilot teaching aeroscout skills, a standard method of discussion or "table talk" should be used. An effective technique is to *define* the subject, then *explain* how and when it is employed. For instance, low level flight is *defined* as flight conducted at a selected altitude at which detection of an aircraft or its departure and landing points is minimized or avoided. *Explanation:* Employment of this technique is usually in the friendly rear area where a great enemy threat is not evident. It is the fastest mode of terrain flight and, thus, is used when time is the prime factor. The route of flight is generally in a straight line, using a constant airspeed and indicated altitude.

By using this teaching technique, we establish in our minds a basic format for passing the required

information to our aviators. This system of teaching and learning also may be employed when discussing unit missions. For example, an area reconnaissance is *defined* as acquiring detailed information within a small area, limited on each side by predetermined physical boundaries. *Explanation:* Area reconnaissance is used when the commander desires information on a town, ridgeline, woods or other feature that may be critical to the operation. Flight to the area is accomplished as quickly as possible using terrain flight and the appropriate techniques of movement. Enemy forces encountered en route are reported and preferably bypassed. The reconnaissance is as thorough and detailed as possible. Intelligence information should be passed back as it becomes known.

One of the most difficult problems facing the individual aeroscout will be learning to see the battlefield and interpreting what has been seen. Visual search is *defined* as the systematic visual coverage of a given area so that all parts of the area have passed within visibility. *Explanation:* Employment of systematic scanning patterns concerns the aeroscout in almost all assigned missions. The factors that affect our abilities to visually search an area are altitude, airspeed and terrain.

Recognition of available visual cues will allow us to further enhance our abilities to successfully complete assigned missions. These visual cues are listed in the Aeroscout Combat Skills Handbook and TC 1-137, along with the associated scanning techniques. Other prime references are Field Manual (FM) 1-51, "Rotary Wing Flight"; FM 17-95, "Cavalry"; and FM 17-35, "Aeroscout Procedures," which is undergoing final staffing at this writing at the U.S. Army Armor School, Ft. Knox, KY. A pilot's capability to describe and demonstrate visual search techniques indicates to the instructor pilot an understanding and ability to employ the techniques against the enemy.

Many aeroscout tasks cannot be fully covered in table talk. Let's mention some of these.

- When the enemy is located, a method of determining range to the target must be identified. Several methods of determining range are found in the Aeroscout Combat Skills Handbook. Understanding and using these techniques reduce our exposure time to the enemy.
- Often the mission may require more than intelligence gathering. Since the aeroscout is virtually unarmed, it must be able to use all available combat power to destroy or suppress enemy positions. The ability to correctly call for and adjust indirect fire and tactical air while operating NOE (nap-of-the-earth) is an essential skill of the aeroscout.
- As we move about the battlefield, we will use our own weapons (attack helicopters) in an overwatch position to provide suppressive fire in the event of enemy contact. Aeroscouts must be able to swiftly and correctly complete a target handoff. The elements of a target handoff are target description, target location, technique of attack and method of control. Aeroscout IPs need to be expert in this area. Once again, study and application of the Aeroscout Combat Skills Handbook is the answer.
- Proper identification of allied and threat vehicles may be obtained by using another reference, FM 1-88, "Aviator's Recognition Manual." As an aid to developing the required recognition skills, the identification principles for most threat tanks should be known, e.g., a low silhouette, rounded turret, bore evacuator located in the forward one-third of the gun tube, Christie-type suspension with no support rollers and lack of a commander's cupola. FM 1-88 also details threat air defense vehicle capabilities and limitations and includes our artillery and armor systems. It is imperative that we be able to identify enemy and friendly vehicles in all types of terrain and visibility.

This article has discussed in very basic terms some of the critical areas of the aeroscout's job which the unit instructor pilot must train and evaluate. These training and evaluation tasks are very demanding. Consequently, aeroscout instructor pilots must be familiar with new developments in their field. This can be accomplished through self-study of the publications and effective use of the knowledge and experience of the unit's initial entry rotary wing aeroscout graduates.

If you do not have a copy of the Aeroscout Combat Skills Handbook, you may obtain a copy by writing:

United States Army Aviation Center
Department of Academic Training
Training Literature Management Branch
ATTN: ATZQ-T-AT-E
Ft. Rucker, AL 36362

DES welcomes your inquiries and requests to focus attention on an area of major importance. Write to us at: Commander, U.S. Army Aviation Center, ATTN: ATZQ-ES, Ft. Rucker, AL 36362; or call us at AUTOVON 558-3504 or commercial 205-255-3504. After duty hours call Ft. Rucker Hot Line, AUTOVON 558-6487 or 205-255-6487 and leave a message

PEARL'S

Personal Equipment And Rescue/survival Lowdown

Kim Aguilera photo by Tom Greene

Kudos Are In Order

Kudos are definitely in order for CW3 David Klindt, who recently "passed the colors" of the U.S. Army, Europe (USAREUR) aviation life support equipment (ALSE) program to CW2 Charles Gibson. As chief of the USAREUR ALSE program and member of the USAREUR Aviation Safety and Standardization Board, Mr. Klindt established a firm ALSE program in Europe through the establishment of the ALSE Maintenance Technician Course. This week-long course has had more than 250 attendees, all of whom took their ALSE knowledge and enthusiasm back to their units, thus laying the foundation for a USAREUR-wide ALSE maintenance program. We thank Mr. Klindt for a job well done and wish him success in his new assignment at Ft. Lewis, WA.

Welcome to CW2 Charles Gibson, the new ALSE chief. Mr. Gibson has attended several ALSE courses in addition to having field experience as a company ALSE officer in the 503d Aviation Battalion (CBT), Hanau, Germany. He will continue as point of contact for all ALSE-related matters in USAREUR, as well as perform the duties of ALSE evaluator with the Safety and Standardization Board and instructor for the ALSE Maintenance Technician Course.

Technical Manual Change Woes

The U.S. Army Communications-Electronics Command (CECOM) has informed us that field users are experiencing problems complying with Interim Change No. 101 to TM 11-5820-800-12, "Radio Set AN/PRC-90." This change outlines a test procedure and performance check that may be difficult to perform at the organizational maintenance level. To resolve this difficulty, CECOM Maintenance Engineering Directorate will make the following revisions to the interim change:

- TS-2530/UR, TS-2530A/UR, AN/PRM-32 and AN/PRM-32A will be listed on page 4 as test equipment required for testing the AN/PRC-90.
- The interim change also will be revised to include a paragraph stating that at the organizational level, where the avionics test equipment required to perform testing—as stipulated on pages 4-17 and 4-18—is unavailable or personnel trained to use the test equipment are not available, test sets TS-2530/UR, TS-2530A/UR, AN/PRM-32 and AN/PRM-32A are authorized for use to complete testing. However, where trained personnel and equipment are available, testing will be carried out using the maintenance test procedures in the interim change.
- Obsolete equipment listed on page B-4 of the interim change will be replaced by standard avionics test equipment presently in the Army repair system.

The above revisions will be provided to field users. In addition, the revisions will be incorporated in the official interim change to TM 11-5820-800-12, scheduled to be fielded on 1 January 1982. Point of contact at this office is Mr. Ed Daughety, AUTOVON 693-3307 or Commercial (314) 263-3307.

If you have a question about personal equipment or rescue/survival gear, write PEARL, DARCOM, ATTN: DRCPO-ALSE, 4300 Goodfellow Blvd., St. Louis, MO 63120 or call AUTOVON 693-3307 or Commercial 314-263-3307

Zipper For Survival Vest

TM 55-1680-317-23&P lists a replacement zipper, national stock number (NSN) 5325-00-182-9945, for the SRU-21/P survival vest. However, problems arise when installing this zipper on the vest because the replacement item is 2 inches longer than the original. The replacement zipper can be reduced to the desired length by removing the zipper stops, cutting the zipper and then replacing the zipper stops. If difficulty is experienced following the above procedure, you may obtain assistance from a fabric repair facility or parachute shop. TM 55-1680-317-23&P is being revised to include the procedure for reducing the replacement zipper length to fit the SRU-21/P vest.

TM Error

We recently received several calls from the field complaining that the NSN for the regular size retention assembly used on the SPH-4 flight helmet had been deleted from the latest Army Master Data File (AMDF). This didn't make sense to us, so we checked the NSN in the AMDF and—lo and behold—it was right there where it was supposed to be! A little further investigation disclosed that the problem was with the technical manual for the flight helmet. Change 4 to TM 10-8415-206-13 lists the retention assembly, regular, under NSN 8415-01-058-0700, which is *not* correct. The correct NSN for this item is 8415-01-056-0700, which is lsited in the AMDF just as it is supposed to be.

Butane Lighter Refill (Again)

In past issues of PEARL (August 1977, January 1978 and January 1980) we told you how to obtain a refill kit for the butane lighter, NSN 9920-00-999-6753, contained in your survival kits and vests. In addition to using the refill kit mentioned in the above articles, we in this office have also found it possible to refuel the subject lighter with the "ZEUS" brand butane refill kit, which can be locally purchased. The ZEUS refill kit comes with an assortment of adapters, facilitating the refueling of both the old style lighter (snap-on cap) and the new style (screw-on cap). The old style lighter is refueled by using two of the adapters provided (red on top of white), while the new style lighter is refueled by using the white adapter alone. POC at this office is Mr. Ed Daughety, AUTOVON 693-3307 or Commercial (314) 263-3307.

Missing Screw

We suppose that at one time or another just about every Army aviator has been accused of having a few screws loose. Although this may be only a figure of speech, loose or missing screws can cause you very serious problems, especially where your life support equipment is concerned. And no item of ALSE has more problems with loose or missing screws than the SPH-4 flight helmet. In the past we have actually witnessed perfectly good SPH-4s being turned in to property disposal simply because they lacked a few screws! One screw in particular seems to cause great difficulty when missing, that being the left-hand thread screw which is part of the visor lock assembly, NSN 8415-00-933-9280. Until now, the only way to replace that screw was to replace the complete assembly at a cost of $4.70 each. Well, we are happy to report that the manufacturer, Gentex Corporation, has assigned a part number to that item so that it may be ordered independently of the overall assembly. The following data is provided for ordering the screw in question:

Screw, Locking, Assembly, Left-hand Thread
PN 74A2860-1, FMC-97427
Per Drawing No. 8-2-523, Item 4-20
Color: Black, Per CL4, MIL-C-13924
Cost: $1.18 Each, Min. Order $25.00 F.O.B.

POC at this office is Mr. Tommy Vaughn, AUTOVON 693-3307, or Commercial (314) 263-3307.

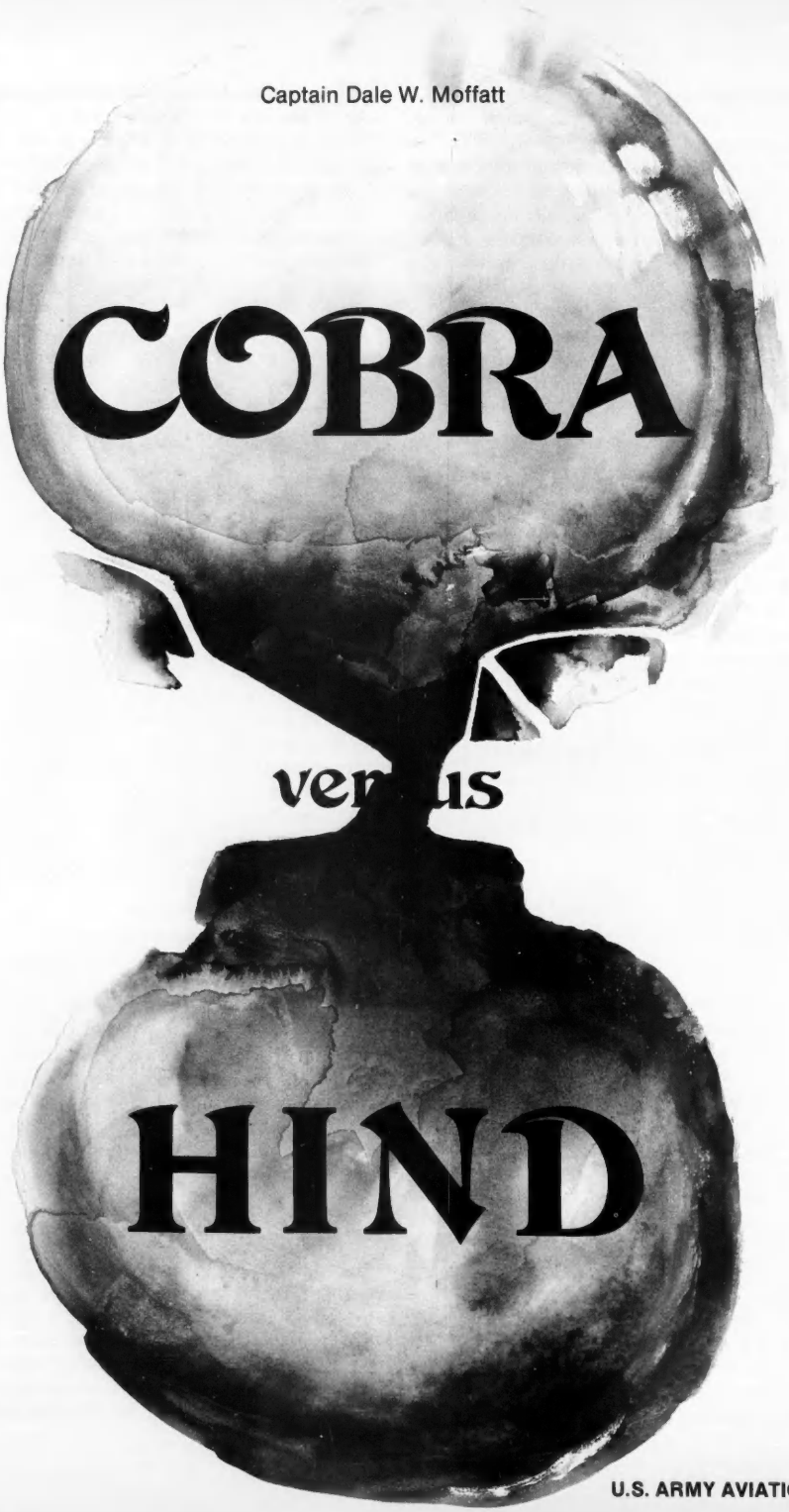
Questions and Answers

We are in the process of ordering the training version of the AN/PRC-90 survival radio mentioned in the June 1981 edition of PEARL. Could you tell us what the inspection requirements will be for this item? Also, could you tell us what piece of equipment we would use to test it? It would appear that the AN/PRM-32A radio test set, which we use to perform monthly checks on our standard AN/PRC-90s, is unsuitable for this purpose, since that test set checks specifically the 243.0 and 282.8 frequencies, while the training radio is on frequencies 236.0 and 251.9. (Dennis Popple, USAR Aviation Support Facility, Everett, WA)

According to personnel at the Base Life Support Shop at Scott AFB, IL, who originally acquainted us with the training radio, there is no inspection requirement for this item. The Air Force considers the radio, survival training, NSN 5820-00-469-5658LS, to be strictly a training aid and not really an item of life support equipment. Consequently, the only time this item is "inspected" is when it is found to be nonoperational during normal use and turned in to avionics maintenance personnel for repair. If you do desire to test these radios, however, we recommend the use of the AN/PRM-32 radio test set, NSN 6625-00-803-3399, rather than the -32A. This test set gives a go/no-go indication and is not dependent on any specific frequencies. Also, remember that you can test the battery for the training radio on the TS-2530/UR or -2530A/UR test set just as you would the battery for the standard AN/PRC-90 radio.

AIR TO AIR

Captain Dale W. Moffatt



THE TIME HAS come to seriously consider the *probability* that Army helicopter crews will have to engage in aerial combat with Warsaw Pact helicopters during the course of the next war. Unfortunately, we as Army aviators will likely come out on the short end of these engagements unless we train now to become skilled in the tactics of air-to-air combat.

I am not advocating that U.S. Army helicopters be diverted from their primary missions for the purpose of engaging enemy helicopters. But I submit that, if not given the skills to survive an engagement with an enemy attack helicopter, our helicopter crews will be unable to perform their primary missions because some of them will be shot down before they get where they are going.

The chief helicopter threat to Army Aviation is the Mi-24 Hind attack helicopter, specifically the Hind-D, -E and later versions. What you as an Army aviator will face in an engagement with the Hind is a two-barreled 23 millimeter (mm) or four-barreled 12.7 mm automatic weapon with a high cyclic rate of fire. The weapon most likely will be directed through a fully-resolving fire control system which takes airspeeds, deflection angles, air data and other variables into account to achieve a high first-burst hit probability. Target acquisition will be accomplished by onboard radar, low-light-level television or forward looking infrared acquisition devices coupled through the fire control computer to the gun system. In addition, 57 mm folding fin aerial rockets and AT2 Swatter or AT6 Spiral antitank guided missiles will be available to the Hind gunner for aerial engagements.

Technologically, then, the Soviets appear to be well prepared to engage in helicopter versus helicopter combat. Whether or not their crews are trained to take advantage of their technological edge is still a matter of contention. We know that Soviet helicopter tactics call for a substantial percentage of their missions to be conducted forward of their forward line of own troops (FLOT); i.e., in airspace over our combat units and support organizations. Thus, we can expect to see Soviet helicopters behind our FLOT in a combat environment.

Are Soviet helicopter crews trained in the techniques of air-to-air combat? I know of no one who can answer that question, but with the increasing interest in this subject evident in Soviet military literature (see "How to Fight Helicopters—Soviet Style" by Captain Carl Daschke in the January 1980 ***Aviation Digest***), it is a better than even bet that Warsaw Pact helicopter air-to-air combat tactics, if not already in existence, will soon be forthcoming. And it is just as safe a bet that your opposite number will receive training in these tactics as soon as they are available.

What this implies is that we as Army aviators will be at a distinct disadvantage if we are forced to engage enemy helicopters without having received training in these tactics. And what *this* suggests is that we must train to counter this very real threat.

In order to train realistically to counter Soviet attack helicopters, it is necessary to first understand their tactics. Normal operating altitudes are believed to be in the area of 18 to 30 meters above ground level (AGL), with the helicopters operating as low as 5 to 10 meters AGL while crossing their FLOT and during operations forward of their FLOT. Therefore, most encounters between U.S. and Soviet helicopters will occur at about the same altitude, with the Soviet helicopter being slightly above the U.S. helicopter.

This provides each crew with different positional advantages. The enemy crew, by being above, derives its advantage from the fact that the friendly crew will be unable to fire without repositioning, due to the fact that the friendly's rotor disc interferes with his own field of fire. A related enemy advantage is that the target (our) helicopters are within the traverse/elevation limits of his trainable weapons, while he is outside the limits of his target's weapons systems.

The friendly crew, by being below the enemy, has a positional advantage in that its helicopter will be more difficult to spot. This is attributable to the fact that the lower helicopter will blend in with the terrain against which it is observed, whereas the higher helicopter will have a tendency to stand out against a contrasting background (usually the sky).

Given present tactics, it therefore appears that in an engagement on the U.S. side of the FLOT, the Soviet helicopter will be spotted first a greater percentage of the time than will the U.S. helicopter. Extensive tests conducted in U.S. Army, Europe by the 503d Aviation Battalion confirmed this to be the case. During these tests, other important lessons were learned as well.

Several factors were identified which either aided or hindered detection of the opposing helicopter. Relative positioning of the aircraft has already been discussed. Other important factors were aircraft motion relative to background (faster relative speed—easier detection) and glint from aircraft systems, specifically the rotor blades, the aircraft canopy, and the main rotor head and mast. The last factor can be readily corrected in combat with a can of paint, but the fact that a faster moving aircraft is more easily detected is worth storing for later recall.

As is to be expected, the addition of another threat to the already heavy workload in a combat cockpit has a detrimental effect on the

COBRA versus HIND

crew's ability to cope with the multitude of tasks to be accomplished. While terrain and obstacle avoidance remains a full-time job, the crew must now take time out from this job to search the skies and treelines for enemy helicopters, as well as navigate, communicate (using a CEOI), avoid wires and accomplish the array of other tasks the mission requires. This has two far-reaching implications:

- First, an intimate knowledge of the operational area and its terrain is a must. Thorough planning and familiarity with the area will allow the crew to devote more time to searching for potential threats.
- Second, and of at least equal importance, is the requirement to train constantly as a *crew*. Tests conducted at the U.S. Army Aviation Center, Ft. Rucker, AL, revealed that crews that had not previously trained together had substantially slower reaction times to threats and stood a dramatically decreased chance of surviving an encounter with an enemy helicopter. Crew stability is an absolute necessity in order to optimally employ any helicopter in combat.

Fine, you say, and where does all this leave us? The bottom line is this: You, the Army aviator, must learn how to cope with the enemy's helicopter threat in such a manner as to have a good chance to survive an engagement and continue with your mission.

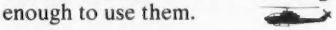
So, how do we do this? First and foremost, we must develop air-to-air combat tactics. The ideas are there; the U.S. Marine Corps has been training helicopter air-to-air combat instructors for a number of years. And the U.S. Air Force is in the business of air-to-air combat. Between these two services there lies a wealth of experience to be tapped.

The approach to these tactics used by both services is that the crew must first learn 1 versus 1 (lvl) tactics, or basic fighter maneuvers (BFM). Once BFMs are mastered, 2v2 tactics are taught to develop team integration. Both 1v1 and 2v2 are stepping stones to many versus many tactics. These are the kinds of engagements you will most likely encounter in helicopter air-to-air combat: free-for-alls at altitudes of 150 feet AGL and less. Many versus many uses (and needs) 1v1 and 2v2 tactics. But how much of each and which parts, and when? Nobody knows. Each engagement is different. In a combat engagement, a crew might use only 10 percent of its training, but which 10 percent is unpredictable and it changes in each engagement.

After the maneuvers have been developed, then we have to *train, train, train.* First we must train instructors, then instructors must train their units. Students completing flight school must have a basic knowledge of aerial combat techniques, so that unit instructors can hone these skills to the proper edge without spending undue time on the basics.

Further, the research and development community needs to be involved in developing or adapting weapons to meet the air-to-air combat needs of Army Aviation. Some encouraging progress has been made in this area, but real results are still far down the pike.

Foremost, we must realize and accept the fact that we need air-to-air combat skills, and we need them *now.* Or else our skills at killing tanks, moving troops or materiel, or finding our foes won't be worth a tinker's damn. We won't live long enough to use them.



About The Author:

Captain Moffatt is the aviation maintenance officer for 13th Support Command (Corps) at Ft. Hood, TX. He is a graduate of the Aviation Maintenance Officer's Course and the TOW Cobra Course, and holds a master's degree from the University of Southern California. He served as a lift platoon leader, attack helicopter platoon leader and maintenance officer in an aviation battalion in Germany prior to his assignment to Ft. Hood. While assigned to Germany, Captain Moffatt was the project officer for air-to-air combat tests in USAREUR.

***Aviation Digest* Air-To-Air Articles**

1. Jossen, Harvey F., "Air-To-Air Combat," July 1974.
2. Baird, Robert L., CW3, "Check Six Or Checkmate," October 1977.
3. "Army's First Air-To-Air Symposium," December 1977.
4. Haering, George, "Analogies And Implications From Fixed Wing ACM," April 1978.
5. Crowley, Charles C., CPT, "Air Combat Engagement," May 1978.
6. Baird, Robert L., CW3, "Air Combat: Something Old—Something New," April 1979.
7. McNair, Carl H. Jr., MG, "Helicopter Air-To-Air Combat Operations—The Big Picture," October 1981.
8. Reinsprecht, Josef, CPT, "Helicopter Air-To-Air Combat—The Concept," October 1981.
9. Brittingham, Michael L., MAJ, "Smart Guys Win: The Thinking Man's Guide To Helicopter Aerial Combat," October 1981.
10. Stacy, John Michael, MAJ, "To Kill A Hind," October 1981.
11. Belov, M., COL, "How To Fight Helicopters," October 1981.

Specialist Four Rick Bretz
Public Affairs Office
XVIII Airborne Corps and Fort Bragg
Fort Bragg, NC

TEACHING PHILOSOPHY

PILOT TO GROUND control: "Emergency, we have a fire in one of our engines. Request permission to land our helicopter."

Ground control to pilot: "Permission granted, cleared for landing, use runway six, fire team will be present to extinguish fire."

"OK, time is up. Your 2 hours are through, good flight," said Charles Leeds, an instructor for the Ft. Bragg, NC, flight simulator branch.

Then the doors of the flying shell opened, and two pilots dressed in flight suits stepped out of a white helicopter-shaped cabin.

The fire wasn't real today, but someday that pilot may face a situation that requires quick thinking and fast reactions. On the next flight those pilots may encounter a fuel leak or a storm; but because of the training on the helicopter simulator, they will be better able to cope with an actual emergency.

Ft. Bragg received four flight simulators in 1977. Since then 500 Ft. Bragg aviators and more than 100 Army Reserve and National Guard pilots have trained about 77,000 hours on them.

Part of the training value of the simulator is in the pool of instructors. Ft. Bragg has eight console instructors with a combined total of 161 years of flying experience, a valuable reservoir of talent that assists them in evaluating the weaknesses and strengths of pilots during training flights. The instructors have flown 43 different types of helicopters and 19 varieties of airplanes. Six of them are retired Army aviators.

"The general theme in the flight simulator branch is that an instructor should know more about flying than the aviator; otherwise, the aviator will not be motivated," Mr. Leeds said. "Aviators who receive meaningful training are enthusiastic about learning and return willingly for more."

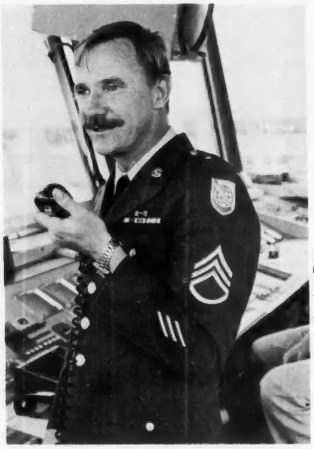
Instructors feel that the pilots are professionals and should be treated with respect.

"'Student' is a forbidden word at the flight simulator branch. Aviators should be called aviators or pilots," according to Mr. Leeds, "and their training is based on their experience and capabilities. Inexperienced pilots don't get complex problems and requirements initially at Ft. Bragg. Conversely, knowledgeable aviators do receive intricate exercises." The instructors' philosophy is that one must learn to crawl, then walk, and finally run in the sequence which develops a world-class aviator.

Training is planned by aviation unit personnel who schedule the pilots' sessions according to their mission and training requirements throughout the year.

"The command and staff support has contributed to the overall success of the flight simulator program. This is the fourth year the simulators have been used, and we are striving daily to improve training and the efficiency of the overall operation," concluded Mr. Leeds.

Army Controllers To The Rescue



photograph by Denise Day

SSG William E. Lovejoy is on temporary duty at Buffalo, NY, from Libby Army Airfield, Ft. Huachuca, AZ. He and nine other Army air traffic controllers are assigned to the civilian towers here and at Niagara Falls, NY

ON THE FIRST DAY of the nationwide strike by Federal Aviation Administration (FAA) air traffic controllers, the U.S. Army Communications Command (ACC) provided 70 Army air traffic controllers to five FAA air traffic control (ATC) facilities. The first contingent of 10 Army air traffic controllers departed Ft. Rucker, AL, early the morning of 3 August for duty at the airport control tower at Atlanta, GA. Later that day 60 more Army air traffic controllers were sent to airports in Pittsburgh, PA, Washington, DC, Kansas City, MO, and Cleveland, OH.

By mid-August, the ACC had more than 200 Army air traffic controllers assisting FAA personnel at 24 civilian air traffic control facilities ranging from Bangor, ME, to Memphis, TN, and from Syracuse, NY, to Burbank, CA. The Soldier controllers were drawn from more than 20 Army installations throughout Continental United States.

Colonel C. E. "Cal" Phillips, commander of the U.S. Army Air Traffic Control Activity at Ft. Huachuca, AZ, said the Soldier controllers "are well trained, fully qualified and FAA certified." He stressed that provision of the Army controllers to augment the FAA personnel had not caused any significant reduction of ATC services or functions at Army airfields and heliports around the world.

Colonel Phillips said the Army controllers "are doing a super, outstanding job." His evaluation of the professionalism of the Army controllers is being echoed by FAA supervisors at many locations. An FAA spokesman at St. Louis, where 15 Army air traffic controllers are working, said, "The military people have saved our bacon." At the Kansas City tower where another 15 ACC air traffic controllers are serving, an FAA spokesman said, "The deployment of military air traffic controllers has allowed us to maintain our full operational schedule." The Kansas City spokesman explained that the military air traffic controllers have been assimilated into the Kansas City tower to the extent that the FAA now has a goal to use only one FAA civilian supervisor per shift on tower duty.

Arrangements were made to allow the Army controllers to carry over leave they were unable to use last fiscal year due to their sudden temporary duty reassignments.

The TDY of the Army controllers has been extended to 2 December.

Readers are encouraged to address matters concerning air traffic control to:
Director, USAATCA Aeronautical Services Office, Cameron Station, Alexandria, VA 22314

1981 ATC Winners

1981 WINNER. The Army's Air Traffic Control Maintenance Technician of the Year is SP6 Joseph W. Kelly, Davison Army Airfield, Military District of Washington (U.S. Army photo)

TOP CONTROLLER. SP5 Kevin R. Smith, Lawson Tower, Ft. Benning, GA, is the Air Traffic Controller of the Year for the Army (U.S. Army photo)

THE BEST AIR traffic controller, maintenance technician and ATC facility in the Army for 1981 have been selected by the Army Communications Command (ACC), Ft. Huachuca, AZ.

Winners in the worldwide competition are Specialist Five Kevin R. Smith, a controller in Lawson Tower, Ft. Benning, GA; Specialist Six Joseph W. Kelly, maintenance technician for the 7th Signal Command's Davison Army Airfield, Military District of Washington; and the Coleman ground controlled approach facility, Mannheim, Germany.

SP5 Smith has worked at Lawson since he graduated in January 1980 from the ATC school at Ft. Rucker, AL. He attained his facility rating in the minimum time at the tower which supports aircraft of all services, including fixed and rotary wing, propeller and jet. The Air Traffic Controller of the Year has credit for assisting several aircraft in distress and numerous medical evacuation flights.

Being the senior military maintenance technician at Davison and at the top of his classes in several maintenance technology schools are part of the qualifications which won the ATC Maintenance Technician of the Year title for SP6 Kelly. He is responsible for precision maintenance and repair of sophisticated electronic and radar ATC systems at Davison, where he has been assigned for 2 years.

Selection as Facility of the Year depends on the quality of work done by that facility's personnel. Those at the 5th Signal Command's Coleman GCA facility in Germany have earned the reputation of providing the most professional ATC service possible in their day-to-day operations.

The awards were presented 16 October at Ft. Huachuca by Major General Gerd S. Grombacher, commanding general, ACC.

"Hangar Talk" is a quiz containing questions based on publications applicable to Army Aviation. The answers are at the bottom of the page. If you did not do well, perhaps you should get out the publication and look it over.

WEIGHT AND BALANCE

TM 55-405-9 and AR 95-16

CW2 Gary R. Weiland
Directorate of Training Developments
U.S. Army Aviation Center
Fort Rucker, AL

1. Who is responsible for the accuracy of computations on the Weight and Balance Clearance Form (DD Form 365F) for a particular flight?

A. Weight and balance technician
B. Pilot in command
C. Flight clearance authority
D. Commander

2. To compute the center of gravity (CG) location for a loaded aircraft, an aviator must first obtain the aircraft's basic weight and moment. Where can this information be found?

A. DA Form 2408-15
B. Operator's manual (-10)
C. DD Form 365C

3. The operating weight of an aircraft includes fuel.

A. True
B. False

4. The moment for a passenger or item of cargo may be obtained by using which formula?

A. Weight × Arm = Moment
B. $\frac{\text{Weight}}{\text{Arm}} = \text{Moment}$
C. $\frac{\text{Weight} \times 100}{\text{Arm}} = \text{Moment}$

5. How much pressure, in pounds per square inch (psi), is exerted on the floor of an aircraft by a 100-pound item of cargo which measures 20 inches × 20 inches at its base?

A. 0.25
B. 4
C. 40

6. Weight removed forward of an aircraft's CG will move the CG aft.

A. True
B. False

7. One duty of a weight and balance technician is to provide unit aviators with training and assistance in the use of weight and balance data.

A. True
B. False

8. How frequently must the weight and balance technician review and redate DD Forms 365F which represent typical aircraft loading arrangements?

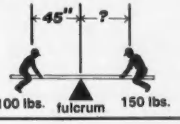
A. Annually
B. Every 180 days
C. Every 90 days

9. Army UH-1 Hueys and UH-60A Black Hawks have recommended weight or CG limits which _____ by loading arrangements normally used in tactical operations.

A. Cannot be exceeded readily
B. Can be exceeded sometimes
C. Can be exceeded readily

10. How far (inches) from the fulcrum must the 150-pound person sit to balance the seesaw?

A. 30
B. 33 1/3
C. 40



ANSWERS

1. B (AR 95-16, para 9e)
2. C (TM 55-405-9, para 14)
3. B (TM 55-405-9, para 6c)
4. A (TM 55-405-9, para 11)
5. A (TM 55-405-9, para 8)
6. A (TM 55-405-9, para 35c)
7. A (AR 95-16, para 9d(3))
8. C (AR 95-16, para 9d(4))
9. B (AR 95-16, para 4b)
10. A (45 in × 100 lb = 4,500 in/lbs; $\frac{4{,}500 \text{ in/lbs}}{150 \text{ lbs}} = 30$ inches)
(TM 55-405-9, para 11a)